



IN DEPTH: The Data Base Debate!

Relational or Codasyl? That was the central issue of a lively debate among heavy hitters in the data base field: Dr. E.F. Codd, C.J. Date, Charles Bachman, Frank Manola and moderator Dr. Eugene Wong. The debate follows Page 76.

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Framingham, Mass. and additional mailing offices ©1982 by CW Communications/Inc.

\$1.50 a copy; \$44/year

September 13, 1982

Vol. XVI, No. 37

NEWSPAPER

Product Spotlight

How to Recover From a Disaster?

By Marguerite Zientara
CW Staff

What would you do if your computer installation went up in a puff of smoke tonight?

If you have pondered that question but still have no answers, the charts on Pages 10 and 11 will give you an idea of what's available in the U.S. in terms of commercial DP disaster recovery sites.

Business has traditionally avoided the whole question of computer-specific disaster recovery in spite of the fact that its dependence on the data stored in computers increases daily. One recent study found disaster control and recovery an "amazingly neglected" area of interest.

"Today, complete faith in the computer's reliability is widespread," reported London-based Butler Cox & Partners Ltd. in its Amdahl Corp.-sponsored study. "Particularly since the advent of large on-line and interactive systems, it is not at all unusual ... for companies to install business

(Continued on Page 11)

Mainframers Kick Off Fall Season

• NAS Enters Scrimmage To Win DDP System Users

By Jeffrey Beeler
CW West Coast Bureau

MOUNTAIN VIEW, Calif. — National Advanced Systems, Inc. formally entered the distributed data processing business today with the introduction of a medium-scale processor/network controller that reportedly combines the IBM 8100's ease-of-use features with the IBM 4300's 370-type architecture.

On one hand, the AS/1100 is optimized for interactive office automation functions and is intended primarily as a replacement for the 8100, a NAS spokesman said.

On the other hand, however, the system reportedly resembles the IBM 4300 series in its communications features, software development aids and its ability to do remote batch processing jobs. The AS/1100 comes with an optional Systems Network Architecture interface that allows the machine to support hierarchical communications with a central site's 370-compatible mainframe, the spokesman said.

The NAS product also supports peer-to-peer communications with either a remote host CPU or another DDP system and allows terminals or other peripherals out in the field to be interconnected to form local networks.

NAS describes its AS/1100 as a modified version of Paradyne Corp.'s recently announced Response system, a combination network controller and remote batch processing machine. Like Response, the NAS system boasts dual processors, one for DP and the other for network

(Continued on Page 8)

• IBM Caps Processor Line With Its Biggest CPU Yet

By Tom Henkel
CW Staff

RYE, N.Y. — With little fanfare on the day that marked the start of the Labor Day weekend, IBM introduced its largest processor to date, the 3084.

The company also announced the 3081 Model Group G, a slightly faster replacement for the Model Group D it brought out nearly two years ago. IBM said the 3081-G processor carries the same price tag as the 3081-D, but features a better price/performance ratio and a growth path for users of IBM's smaller 3083 series of processors (story on Page 6).

Combined, the announcements mean that a user of IBM's entry-level 3080 series processor, the 3083 Model Group E (a comparatively small mainframe processor), can upgrade to IBM's biggest processor without having to scrap existing hardware. In addition, 3080 series users who convert to IBM's recently announced MVS/XA operating system can make processor upgrades without significantly altering their operating systems, IBM said.

The 3084 — made up of two 3081 Model Group K processors, each of which is comprised of one dyadic (two tightly coupled) processors — is being offered only as an upgrade to the 3081-K. The four processors give 3084 users 1.9 times the performance of the 3081-K, according to the vendor.

The 3084 features up to 64M bytes of main memory and 48 I/O channels. It comes in configurations with 32M, (Continued on Page 6)

Computer Sticks, So Goode Predicts

By Bruce Hoard
CW Staff

LOS ANGELES — Bud Goode was uncomfortable. He fumbled from one readout to another, marshaling an army of last year's statistics. The Sperry Univac 1106 stood pat. It refused to pick a winner in next January's Superbowl XVII. Too many variables — injuries, the human element, weather. But Goode had to choose.

The man who picks 'em for the Philadelphia Inquirer and sells a weekly 80-page computerized readout to some of the National Football League's top coaches was on the spot.

"Long-range predictions in football are so dependent," he lamented. "It's foolish to make them."

Pressed, he gave ground. Despite

the fact the Dallas Cowboys and Philadelphia Eagles are statistically dead even in the NFL's National Football Conference, he admitted to "leaning" toward the Eagles as Superbowl finalists.

He grimaced when asked to pick a finalist from the American Football Conference. The Cincinnati Bengals, the San Diego Chargers. Bengals, Chargers. Chargers, Bengals. It could go either way.

"I'm going to go with Cincinnati," he finally declared, "because San Diego has got to prove to me that its defense is better this year than it was last."

Now the big one. The colossus of American sport. The Superbowl.

Goode agonized. There was a moment's pause. Then he spoke: "If

Goode's forced to make a pick, he goes with the stronger defensive team. Philadelphia."

Goode made other, more comfortable picks based on the 130 variables crunched each week by the 1106. Last year's Superbowl champs, the San Francisco 49ers, will fight it out for supremacy in the NFC West with the Atlanta Falcons. The Detroit Lions and Tampa Bay Buccaneers will contest the AFC Central Division's top spot.

In the AFC, the Kansas City Chiefs are a "dark horse" that may push the Bengals. The New York Jets will win in the AFC East, "but Miami will be close," he added.

Returning to the more predictable present, Goode turned his attention (Continued on Page 8)



Wide World Photo

Will San Francisco quarterback Joe Montana reign triumphant once again in Superbowl XVII?



Editor John C. Whitmarsh
Managing Editor Rita Shoor
News Editor Cheryl M. Gelb
Senior Editors:
Features Catherine Marengi
Software Lois Paul
Communications Phil Hirsch
 Bruce Hoard
Systems Timothy J. Scannell
Office Automation Bruce Hoard
Industry Marcia Blumenthal
Writer/Analysts: Marguerite Zientara
 Tom Henkel
Senior Writer: Bill Laberis
Staff Writers: Jim Bartimo
 Susan Blakeney
 Paul Gillin
Correspondents:
New York Bob Johnson
Washington, D.C. Jake Kirchner
West Coast Robert Batt
 Jeffrey Beeler
Chief Copy Editor Donovan White
Copy Editors: Dave Bouffard
 George Cohen
 Kathie Gow
 Patti Hartigan
 Patricia Keefe
 Rick LePage
 Betsy Morse
 Deborah Scaduto
 Barbara T. VanScoyoc
Editorial Assistants: Nancy Pinks
 June Fetting
Contributors:
Education J. Daniel Couger
Taylor Reports Alan Taylor
Human Connection Jack Stone
SPECIAL PUBLICATIONS
Computerworld Extra!
Editor Jack B. Rochester
Computerworld OA
Editor Ann Dooley
Copy Editor Nancy Fleming

Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES:
New York City: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Telephone: (212) 570-2135.

West Coast: 257 Lytton Ave., Palo Alto, Calif. 94301. Phone: (415) 328-9064.

Washington, D.C.: 880 National Press Building, 529 14th St. N.W., Washington, D.C. 20045. Phone: (202) 547-6718.

England: Richard Heese, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481.

W. Germany: Eckhard Updehl, CW Publikationen, Friedrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: 5215350.

France: Patrick Morel, Le Monde Informatique, 42 Avenue Montaigne, 75008 Paris. Phone: 720.85.66.

Asia: Mr. Shohel Kurta, Computerworld Japan, 1-19-7 Shintomi, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217.

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133. Telex: SECCO AA25468.

Brazil: Eric Hippiau, Data News, Computerworld do Brasil, Services e Publicações Ltda., Rua Alexandre Gusmão, 2510th Floor 02031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

Mexico: Richard Small, Computerworld de Mexico, Oaxaca 21-2, Colonia Roma, Mexico City 7 D.F. Phone: (905) 514-6218. (905) 514-6209.

Spain: Neil Kelley, Computerworld/Espana, Barquillo, 38, Madrid-4.

Denmark: Helle Lind Christensen, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.

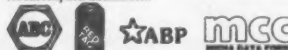
Second-class postage paid at Framingham, Mass., and additional mailing offices PN127420. Computerworld (ISSN-0010-4841) is published weekly, except: March (7 issues), June (5 issues), September (6 issues), October (5 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Copyright 1982 by CW Communications/Inc. All rights reserved.

PHOTOCOPY RIGHTS: permission to photocopy for internal or personal use, or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, MA 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. Special requests should be addressed to Nancy M. Shannon, CW Communications/Inc., Box 880, 375 Cochituate Rd., Framingham, MA 01701. ISSN 0010-4841/82 \$3.00 + \$.50 \$1.50 a copy: U.S. - \$44 a year; Canada, Central & So. America - \$110 a year; Europe - \$165 a year; all other countries - \$245 a year (airmail service). Four weeks notice is required for change of address. Please allow six weeks for new subscription service to begin.

Computerworld can be purchased on 35 mm microfilm through University Microfilms Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. Computerworld is indexed: write to Circulation Dept. for subscription information.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Defense's Hand Strengthened

IBM 'Sting' Files Stay Open: Judge

By Jeffrey Beeler

CW West Coast Bureau

SAN FRANCISCO — A federal judge here has rejected a government request to seal files detailing IBM's role in the recent Federal Bureau of Investigation "sting" operation against two leading Japanese electronics firms.

In a Sept. 3 hearing in U.S. District Court here, Judge Robert Aguilar reaffirmed a court order he issued only about a month earlier. The order in question granted defendants in the IBM trade-secrets theft case permission to inspect any files that may shed light on IBM's relationship with federal investigators.

Aguilar's decision is believed likely to strengthen the defense's hand as it seeks to prove its long-standing contention that:

- The targets of the FBI's undercover investigation are victims of government entrapment.

- The government's sting operation was carried out under IBM's direction.

- Investigators in the case were more concerned with squelching the industry giant's competitors than with protecting its trade secrets.

The outcome of the Sept. 3 hearing has left defense attorney Lawrence Callaghan and his client Raymond Cadet feeling generally "gratified," the lawyer said. Callaghan interpreted Aguilar's ruling as a tacit acknowledgment by the judge that the defense has raised enough legitimate questions about IBM's involvement in the FBI sting operation to warrant further investigation.

In other Sept. 3 court actions, Aguilar amended a second court order that threatened to place many of the case's most important documents under a tight lid of secrecy. In its revised form, the court order is much more limited in its scope than before and applies only to documents that contain bona fide IBM trade secrets.

Although the secrecy order has been relaxed somewhat, Aguilar upheld a provision that denies expert witnesses access to any secret IBM documents until the individuals' names have been forwarded to the prosecution. The requirement for advance notice has drawn fire from the defense.

Aguilar's Sept. 3 rulings were precipitated by a sequence of legal events that began earlier this summer when the defense requested access to huge quantities of government and IBM documents. The purpose of the request was to try to uncover evidence that might damage the prosecution's case and possibly even force the federal government to drop its charges.

Shortly after Aguilar last month granted the defense's request for IBM documents, the local U.S. Attorney's office appealed the decision. The court's response to the prosecution's protest came during the Sept. 3 hearing.

Aguilar's ruling paves the way for the defense to obtain an assortment of IBM documents and compels the government to disclose the identities of the sting operation's confidential informants. The decision also forces the prosecution to reveal personnel

information about the agents who participated in the investigation.

Confidential informants and undercover investigators posing as gray-market electronics dealers played a key role in cracking the industrial espionage case, which has resulted in indictments against 21 individuals and two Japanese firms — Hitachi Ltd. and Mitsubishi Electric Corp. Most of the individual suspects and both the companies have been charged with conspiring to steal IBM trade secrets and transport them from the U.S. to Japan.

CW Seeking DBMS Articles

There is still time to submit an article for the upcoming special report on data base management systems (DBMS), which will appear in the Oct. 25 issue of *Computerworld*.

We are interested in application stories describing how you have selected a DBMS and how it is working for you. In addition, we would like to see articles that are not product-specific describing DBMS concepts.

Please keep your submissions between four and seven pages in length (not including graphics, which are welcome) and send them by Oct. 1 to Susan Blakeney at *Computerworld*, 375 Cochituate Road, Framingham, Mass. 01701.

This Week

IN DEPTH

The Data Base Debate! Follows Page 76

NEWS

Lack of Good Teachers Marring DP Education 4
 Memorex Offers Thin-Film 3370, 3380 Rivals 5
 IBM Fills Performance Gap by Bringing Out 3081-G 6
 New IDMS Applications Modules Ready in '83 7
 Gsat Plans Satellite Net to Underprice AT&T 8
 Product Spotlight: Disaster Recovery 10-12
 Calif. Tax Bill Would Exempt Custom Software 13
 Manual Tells How to Hire Handicapped DPers 14
 Lawyer Sees Trade Secrets Suits Escalating 15
 Food Firm Gobbles Costs With Hand-Held Units 16
 Off the Press 17
 Scotland Yard to Battle Crime With System 18
 Credit Union Credits Growth to In-House System 20
 Utility Saves With In-House Transfer Agent 21
 Hospital Slices Stockpiling Costs With System 22
 Firm Finds Pooling Credits, MIS Brings Benefits 24
 Metal Part Reps Obtain Quotes While On-Site 26
 Flight Simulations Cut Flaws in Drone Design 28
 Turnaround Time 29
 College Chef Feeds Many With Micro's Aid 30
 Computer Files Digesting Protein Combinations 31
 User-Supplier Alignment Can Cut Software Costs 32
 Doll Trade Mere Child's Play With System 33
 College Finds Basic Blocks for Growth in System 34
 Managers Use Desktop Terminal to Access Data 35
 Mortgage-Tracking System Cuts Costs 36
 Decision to Try Unproven Package Pays Off 38
 T/S Helps Multinationals Track Subsidiaries 42
 Auto Decorator Logs On to Hold Profit Line 43
 Perfume Firm Sniffs Success With System 44

EDITORIAL

Editorial: Time for a New Script 60
 Softline: Micro Software/Hardware: Profit Picture 61
 Reader Commentary: Rethinking DP Ethics 61
 Reader Commentary: Managing Employees 62
 Reader Commentary: How to Identify Tech Writers 65

SOFTWARE & SERVICES

Hero 2.0 Supports All MVS Versions 69
 Packages Boost CICS Performance 70
 Accounting Aids Out for 370, 4300 72
 Cobol Task-Tracking System Bows 73
 Version 3 of VAX/VMS Gets Adabas-M Support 74
 Spreadsheet Software Out for IBM Series/1 Users 75
 Application Manager Out for Use With HP 3000 76

COMMUNICATIONS

Study: Activity Focused on Local-Area Micro Nets 77
 Northern Telecom SL-1 Adds Optional Features 78
 Carphone 9830 Terminal Burroughs Compatible 82
 Packages Integrate Micros Into Corporate Net 83
 Modern Out for High-Speed Devices 84

SYSTEMS & PERIPHERALS

Year-Old DP Start-Up Offers Field 32-Bit Mini 85
 Intelligent Visual Preprocessor Unveiled 87
 CAD/CAM System Offers Desktop Display Unit 88

MINIWORLD

Specifics of Overview Offer Productivity Answers 89
 Turnkey Time Accounting System Bows 92

OFFICE AUTOMATION

What Do Secretaries Want in a Workstation? 95
 DP Function Available for IBM Displaywriter 97

COMPUTER INDUSTRY

Intel to Provide IBM With 2164A Technology 99
 Datapoint Earnings Down to \$2.4 Million 99
 XCS Now Marketing Xerox's 820-II Micro 101
 Yourdon Steps Down as President 102
 South Africa Experiences Explosion in DP 104
 U.S. Service Firms Not Seen Abroad 106

ADVERTISING INDEX 142

Electronic Mail

For the cost
of the software alone



ADR/EMAIL™

Speeds messages across the country—or across the hall

You probably have the most expensive components of an electronic mail system. An IBM (or plug-compatible) mainframe, CRTs, 328x printer, TTY dial-ups, and TP networks. So all you need to become operational is ADR/EMAIL software. At a fraction of the cost.

ADR/EMAIL accelerates communications. Reduces labor and material costs. Saves manager's time. Cuts administrative efforts. Simplifies decision making. It's user-friendly with commands so simple virtually everyone will quickly become proficient.

No other system gives you so many options: messages go across the country or across the hall—electronically or hard copy. Send the same message to many people. Read a message and send it on with comments. Keep copies permanently. Impose security as tight or as loose as required. Handle your own mail or let your surrogate process it. ADR/EMAIL even gives you direct interface to the ADR/ETC automatic word processor to transmit larger books and manuals.

ADR's 23 years of software leadership is your assurance that ADR/EMAIL will revolutionize your communications. It belongs in the office of tomorrow. But ADR brings it to you today.

ADR/EMAIL, which runs under MVS, VS1 or DOS/VS(E), is part of ADR's integrated network of fourth-generation system software that solves today's problems and builds a foundation for tomorrow. Contact your local ADR office or send coupon to learn more about today's most advanced electronic mail system.

APPLIED DATA RESEARCH

The Big Difference is our integrated network

Route 206 & Orchard Rd., CN-8 CW 9/13
Princeton, NJ 08540/(201) 874-9000

I am interested in:

- ☐ Management presentation on ADR/EMAIL.
- ☐ Call from marketing representative.
- ☐ ADR/EMAIL product literature.

Name/Title _____

Company _____

Address _____

City/State/Zip _____

Telephone _____

Computer _____

Vocational Schools — Part 2

Lack of Good Teachers Marring DP Education

By Tim Scannell
CW Staff

NEW YORK — While private vocational schools and colleges offering courses in data processing do not always share the same educational patterns, they do share the same goal: preparing students for entry into the computer industry.

Unfortunately, they also share the same problems: equipment that is outdated or lacking, inappropriate languages and a dearth of qualified teachers.

Ironically, most of these problems reflect the very nature of the industry that both educational pathways are trying to serve. The first two problems, although important, can be avoided through a little educational comparison shopping. The third — teacher inadequacies — is not always obvious but has the greatest potential impact on a student's future.

Outdated Equipment

While outdated computers can be a problem in a data processing course — they are not state-of-the-art, are prone to frequent breakdowns and usually cost more to maintain than they are worth — they are a fact of DP life. Architectures and systems in the computer industry change faster than the seasons.

Unfortunately, vocational schools cannot keep up with equipment changes because of the cost involved. If they tried, tuition costs would be astronomical, according to one source.

To resolve this problem, many vocational institutions resort to time-sharing terminals that tie into large computers at local corporations or universities.

Colleges and universities usually receive equipment donations from large minicomputer or mainframe firms looking for a tax write-off, good public relations and an early exposure of students to their equipment instead of the competition's machines. However, many of these donated systems will be outdated by

the time students trained on them graduate.

The U.S. government and private industry are trying to rectify the situation of old equipment donations by stimulating more firms to donate computers in exchange for sizable tax breaks. That is the focus of the Technology Education Act, also known as the Stark Bill, sponsored by Rep. Fortney H. Stark (D-Calif.) and aggressively promoted by Steve Jobs, chairman of Apple Computer, Inc.

The Stark Bill is presently before the House of Representatives, which is expected to pass it sometime before the end of the year; a similar bill is being considered by the Senate.

The problem of languages can easily be resolved by a little homework on the part of the student. The majority of the vocational schools teach Cobol and Basic because those two languages are popular in both business and microcomputing, respectively.

The student must plan for the field he wants to tackle and take the appropriate courses.

One of the more serious problems, just now becoming obvious, is the dearth of proficient teachers. This problem is mainly attributable to the high salaries available to qualified people in the DP industry and the inability of educational institutions to lure them away from industry and into teaching.

Basically, students are only as good as their training — and the level of that training is steadily declining because of the lack of skilled teachers, according to a number of sources both in academia and the computer industry. Surprisingly, most of these inadequate teachers are involved in the data processing courses offered by colleges and universities and not the vocational schools.

"There are lots of new technologies coming out, and the industry is changing very rapidly. It's tough to keep faculty people and instructional material geared for the kind of things students need to know as far as employment is concerned... and

Tens of thousands of students will enroll in vocational or college data processing courses this month. But will these courses sufficiently prepare them for an entry-level position in DP? And who will have a more difficult time finding a job — the graduate of a vocational school or the degree-carrying product of a four- or five-year college?

In this second part of a three-part series, CW Senior Editor Tim Scannell discusses some of the problems faced by both institutions, most critically — the quality of instruction. Next week, Scannell will look at who fares best at getting that first job.

to last them for a lifetime of employment," said Roland Spaniol, a professor at the University of Illinois and president of the Institute for Certification of Computer Professionals (ICCP). "Universities are really over a barrel, and one of the things that has gotten them over this barrel is the fact that they can't unload teachers they no longer need," he explained.

Spaniol has been involved in data processing for nearly two decades and has spent time on both sides of the educational fence — as an instructor and in industry, including a short stint as director of the University of Illinois computer center. He insists that many DP instructors are teaching what he calls "penmanship physics." They know enough about the computer basics to give barebones instruction, but do not delve into issues that will be needed in the real world.

Universities cannot get rid of these outdated teachers because they are full professors and entitled to all the protection of tenure. And they can't

hire truly qualified teachers because they can't match the full-time salaries these people are commanding in the DP industry.

The big-name data processing vocational schools, on the other hand, can afford to hire qualified teachers from industry because students pay for vertical instruction and the schools do not always insist that instructors teach full-time. "They can go into industry and get a person who is working with the latest IBM buzz and is looking for a few extra bucks on the side, and they can have them teach that buzz to other people," Spaniol said.

Wayne Leroy, a regional coordinator with the American Vocational Association based in Washington, D.C., agrees that finding and hiring state-of-the-art teachers is more of a problem for universities than for vocational institutions. "When you don't have an adequate amount of dollars to operate from, you're forced into a situation where you're having to pay teachers less. So you get less qualified teachers," he said.

Leroy noted that a qualified computer programmer can "very easily" make \$25,000 to \$30,000 per year in metropolitan Washington. However, data processing or programming teachers on a college level are usually locked into a salary schedule of \$10,000 to \$12,000.

While the larger vocational schools have more money to hire more qualified teachers and can target their educational programs toward more specific areas in data processing, the smaller ones share universities' problem of declining teacher adequacy. In Boston recently, for example, some of the first graduates of the Computer Learning Center — part of a for-profit DP education chain operated by Airco, Inc. of Montvale, N.J. — complained that two of the school's instructors were not familiar with the teaching material and could not sufficiently communicate with the students.

No Clear-Cut Answers

There are no clear-cut answers to the problem of teacher inadequacy, especially since the pace of technological development in the computer industry shows no sign of slowing down to allow teaching to catch up with the real world.

Many colleges and four- or five-year schools, like Northeastern University in Boston, offer cooperative learning programs that allow students to spend part of their time in the classroom and part of their time in a DP job. Time on the job — arranged by contract between the schools and area companies — is counted as part of the student's degree work.

The National Association of Trade and Technical Schools (Natts), a professional organization based in Washington, D.C., offers a competency-based staff development program aimed at vocational instructors that consists of a series of workshops on the latest developments in the DP field. Material for the training seminars was originally

(Continued on Page 5)

Computer Camps, Club Med Boosting Students' DP Literacy

By Tim Scannell
CW Staff

It is like some technological Catch-22. Computer literacy, the goal for which colleges and vocational schools strive, is also the source of most of their problems.

Students entering four-year colleges and vocational schools today are not the same students of five or 10 years ago. Most, if not all, have been brought up in an age where the pocket calculator is a relic and the personal computer commonplace. They are more apt

to know Basic and the particulars of Digital Research, Inc.'s CP/M than verb conjugations.

High school and even pre-high school students have a wide assortment of computer clubs and organizations that not only cater to people who were weaned on Pac-Man, but which provide a solid data processing education. For example, the Boston Computer Society — the largest nonprofit independent personal computer club in the U.S. — has more than 5,000 members. Its president,

Jonathan Rotenberg, is 19 years old and started the club about five years ago.

In the past few years, traditional summer camps — offering sun, fun and friendship — have been supplemented by computer camps that also offer sun, fun and friendship along with courses in microcomputer programming. Even Club Med, an organization offering vacation hideaways in secluded areas of the globe, has recognized the public's insatiable desire for computer literacy, and this year be-

gan offering microcomputers and training courses to guests at some of its resorts.

Approximately 4,878 high schools throughout the country offer five or more vocational education programs to their students — a good number of them related to data processing, according to Wayne Leroy, regional coordinator of the American Vocational Association. These students are familiar with the state of the art and know exactly what they want from a DP education.

Memorex Offers Thin-Film 3370, 3380 Rivals

By Jeffery Beeler

CW West Coast Bureau

SANTA CLARA, Calif. — Memorex Corp.'s long-expected entry into the thin-film technology arena became a reality last week with the introduction of the company's first disk subsystems to compete head-on with the IBM Models 3370 and 3380.

The larger of the two subsystems is the 3380-compatible Model 3680, which boasts a single-spindle architecture that reportedly allows users to configure disk-module strings consisting of either odd or even numbers of spindles. The other thin-film subsystem is the Model 3690, a 3370 replacement that has already been shipped overseas but has yet to be made available in the U.S.

Memorex intends eventually to sell the 3690 domestically, but it refused last week to commit itself publicly to a specific timetable.

Tools, Teachers Mar DP Courses

(Continued from Page 4)

developed by Ohio State University's National Center for Research in Vocational Education and is considered the standard for vocational education, a Natts spokesman said.

People already involved in computing are doing their part through professional organizations such as the ICCP, whose goal is to lift data processing to the professional level now shared by doctors and lawyers. The ICCP does this by offering an intensive testing program that leads to a Certificate in Computer Programming. About 24,000 programmers are currently certified by the organization, ICCP President Spaniol said.

The Last to Know

Unfortunately, like a negligent father, the computer industry is the last to know about the problems of its struggling siblings. Accustomed to an endless flow of talented people from both colleges and vocational institutions, corporations that hire DPs are now waking up to the fact that the high-technology tap is closing. The bottom line is that the graduates are denied a quality education and the industry is denied the adequate talent.

At the Electro '82 convention held earlier this year, Ray Stata, chairman and president of Analog Devices, Inc. and founder of the Massachusetts High Technology Council, mildly shocked the mostly engineering audience by declaring that most U.S. companies and even the U.S. government have no long-range plans to sustain technological growth in the electronics and computer fields [CW, May 31].

According to Stata, the lack of quality education is the most dangerous threat facing the DP industry — one that could eventually undermine whatever lead the U.S. has on the rest of the world in electronics.

Spurred by this pronouncement and other indicators, the New England Board of Higher Education, a publicly funded group, met secretly two weeks ago to discuss the region's "sagging capacity to educate."

Capable of transferring 3M byte/sec and said to boast an average access of 16 msec, the 3680 consists of three basic components — a 3888 storage controller, a 3683 string controller and a 3680 disk module. Like their IBM counterparts, each disk module holds 1.26G bytes.

Up to eight of the modules can be tied together to form a string with eight spindles and a total storage capacity of 10.08G bytes.

The 3690, by contrast, consists of two components, a 3693 controller and a 571.3M-byte 3690 disk storage module, which incorporates two independently addressable actuators and one head-disk assembly. Memorex credits the 3690 subsystem with transferring 1.86M byte/sec

and rates the product's average access time at 20 msec.

With the larger of the two Memorex disk subsystems, a minimum configuration requires a 3683 string controller and two 3680 disk modules. Because of the subsystem's architecture, users can expand their minimum configurations with as few or as many spindles at a time as they please.

The 3680 is thus said to provide better configuration flexibility than subsystems using a dual-spindle architecture, which permits a user's spindle count to be increased only in even-number increments.

With the 3680 subsystem, each 3888 controller comes with two independent directors, each of which can

support up to two full strings. A single string can consist of a 3683 string controller and up to eight 3680 spindles.

A 3683, in turn, supports two independent data paths that connect to the 3888's directors. The string controller also provides a maximum availability path selection feature that allows each path to control all its accompanying actuators.

A configuration consisting of a 3683 string controller and two 3680 disk modules costs \$116,050. A 3888 lists for \$78,790.

Shipments of the 3680 subsystem are slated to begin within the next six or seven months from Memorex at San Tomas and the Central Expwy., Santa Clara, Calif. 95052.

At Last!

A practical approach for project planning & control.

Starting this month, YOURDON Inc. is introducing the workshop seminar that every project manager needs in order to do their job right. This innovative seminar is a practical approach for Project Planning and Control that promises to disentangle the confusion that besieges data processing projects.

Project Planning and Control Workshop gives you simple and explicit procedures on how to (1) Understand the project life cycle. (2) Manage organizational project expectations. (3) Plan and manage the project. The seminar also supplies you with all the tools you'll need to (1) Establish organizational standards for effective project management. (2) Develop accurate estimates. (3) Draw PERT/CPM and GANTT charts and achieve combination BAR/CPM charts. (4) Determine optimal costs, schedules and resources. (5) Avoid costly delays and overruns.

Project Planning and Control Workshop integrates instruction, open discussion, group exercises and student presentations with a case study packed with essential materials, check lists and charts.

Truly a mastery course, this unique program dedicates over 40% of class time to practical application of the new techniques and leaves you with a comprehensive project plan listing the tasks that must be completed in every project along with a PERT chart showing the sequence and dependencies of all project activities.

The five day course covers the following topics. (1) Why projects fail. (2) Benefits of project

planning. (3) Development life cycle. (4) Evaluation of hardware/software packages. (5) Managing the project development process. (6) Project expectations. Scope, constraints and assumptions. Analysis of alternatives. Cost/benefit analysis and criteria for acceptance, completion and success. (7) Project planning. (8) Networking. (9) Resource scheduling, leveling and loading. Normal costs, crash costs and risk analysis. (10) Implementing and managing the project.

Sign me up for "Project Planning and Control Workshop."

- ☐ In San Francisco, October 4-8.
- ☐ In Toronto, October 11-15.
- ☐ In Anaheim, November 15-19.
- ☐ In Phoenix, November 29-03.
- ☐ In Houston, December 6-10.
- ☐ In Boston, December 13-17.
- ☐ Send me a detailed course brochure.

Name _____

Organization _____

Title _____

Address _____

City _____

State _____

Zip _____

Telephone _____

YOURDON

1133 Ave. of the Americas, New York, NY 10036
Phone (212) 730-2670

Call toll free 800-223-2452. In San Francisco 415-871-2800. In London 01-836-8918

YOURDON

IBM Fills Performance Gap By Bringing Out 3081-G

By Tom Henkel
CW Staff

RYE, N.Y. — Analysts repeatedly said IBM's 3081 Model Group D pro-

IBM Cuts Prices But Raises Rent Of 3081-D, K

RYE, N.Y. — In addition to announcing two new processors (story on Page 1), IBM cut prices on its 3081 Model Group D and K processors by up to 10%.

However, the vendor raised lease and rental prices on those same machines by 10% while decreasing the minimum monthly maintenance charges by up to 25%.

And in a move that analysts view as an appeasement to customers who are currently using 3081 Model Group D processors, IBM is offering a \$200,000 price reduction on the 3081 Model Group D to Model Group K processor upgrade package. The same price decrease is available to users of the new Model Group G processor if those users decide to upgrade to a Model K processor before the end of the year.

The Model Group D- or G-to-K upgrade normally costs \$600,000. Users can now buy that package for \$400,000 if:

- A Model Group D processor is installed on or before Sept. 30.
 - The effective date of purchase of an installed 3081 D or G is on or before Dec. 31.
 - The processor upgrade package is ordered on or before Dec. 31.
 - The processor upgrade is installed no later than Dec. 31, 1983.
- Price reductions go into effect immediately. Lease and rental price increases go into effect Jan. 1.

cessor did not fit into the price/performance pattern set by the 3083 and 3081 Model Group K. IBM solved that apparent discrepancy when it recently announced a replacement processor, the 3081-G.

Like the 3081-D and 3081-K, the Model Group G is a dyadic processor available with main memory configurations of 16M, 24M or 32M bytes. IBM said the processor offers "slightly" more power than the 3081-D, but a company spokesman could not say exactly how much more power is available.

IBM stated that users of 3083-B processors can field-upgrade to the 3081-G. That means users of the 3083-E, the smallest member of the 3080 series, can field-upgrade up to a 3084 without going through a major hardware exchange.

A 3081-G processor with a 3082 processor controller and coolant distribution unit ranges in price from \$3.54 million for a 16M-byte processor with 16 I/O channels to \$4.09 million for a 32M-byte, 24-channel system, IBM said. The system leases for \$128,045/mo and \$133,515/mo, respectively; rental prices are \$147,555/mo and \$166,890/mo, the vendor said.

IBM Unveils 3084, New Top of Its Line

(Continued from Page 1)

48M or 64M bytes of main memory.

The processor can be operated as two independent dyadic systems or as one four-processor system. An IBM spokesman last week could not say whether further partitioning of the processor — for example, dedicating three of the four processors to one task — is possible.

Running as two dyadic systems, the 3084's internal instruction rate is about the same as two 3081-K processors. However, when operating as a

System	3081-D	3081-G	3081-K	3084
Characteristics				
Relative Performance ¹	465	500	675	1,282
Mips ²	10	11.4	15	27
Memory Size in Bytes (Minimum-Maximum)	16M-32M	16M-32M	16M-32M	32M-64M
Purchase Price ³ (Memory Size)	\$3,260,000 (16M)	\$3,260,000 (16M)	\$4,260,000 (32M)	\$8,580,000 (64M)
Lease Price (Lease Term)	\$110,485 (4 Year)	\$110,485 (4 Year)	\$147,520 (4 Year)	\$315,620 (4 Year)
Machine Cycle Time (Nsec)	26	26	26	26
Channels (Minimum-Maximum)	16-24	16-24	16-24	48
Cache (Buffer) Size ⁴	64K	64K	64K	64K
Bus Architecture?	No	No	No	No
Price per 1M Byte Of Main Memory	\$25,000	\$25,000	\$25,000	\$25,000

1. CW estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-3 equaling 45. These numbers are designed to put the processor into perspective with other systems; it is not a buyer's guide. All systems are not alike; they use different operating systems, instruction sets and architectures and, therefore, cannot be directly compared. In addition, actual relative performance may vary with the application, peripherals and software.
2. CW estimates.
3. For the processor only. The 3084 is available only as an upgrade from a 3081-K processor. For example, a 32M-byte, 16-channel 3081-K processor costs \$4,260,000. To upgrade that

processor to a 3084, the user would have to add an 8-channel enhancement (\$100,000) and a 3082 processor controller enhancement (\$270,000). To upgrade to a 64M-byte, 48-channel 3084, the user must add a new processor (\$3,680,000) and a 3082 controller/channel upgrade (\$270,000). The actual upgrade cost for the processor only (not including extra power supplies, cooling units and other prerequisites) is \$3,950,000.

4. The 3081 processors are actually two closely coupled processors with 64K bytes of buffer storage on each processor. The 3084 operates as four closely coupled processors with 64K bytes of buffer storage on each processor.

The New Lineup

CW Chart

tightly coupled multiprocessor, the 3084's instruction rate is about 1.9 times that of the 3081-K in commercial and scientific environments, IBM said.

As a multiprocessor, the 3084 operates only under MVS/XA. In this operating mode, all four processors present a "single system image" to users while offering more efficient utilization of peripheral devices and data processing resources, according to IBM.

When operating as two dyadic processors, the 3084 can use either MVS/SP Version 1 Release 1.1 and above or MVS/XA. In addition, IBM's Virtual Machine/Extended Architecture Migration Aid can be used on the 3084 to assist in migration to MVS/XA, IBM said.

Controller Expanded

To support the 3084, IBM announced an expanded version of its 3082 processor controller. The 3082 Model Q is actually two controllers. In a multiprocessing environment, the second controller is used as a backup; in a dual dyadic configura-

tion, one controller is assigned to each processor, according to an IBM spokesman.

Users who upgrade 3081-K processors to the 3084 must install a second set of support peripherals including a second 3087 coolant distribution unit, 3278 Model 2A console and 3089 power distribution unit, IBM said.

All major software subsystems available on the 3081-K, such as TSO, IMS data base management system, and CICS are supported on the 3084. Because IBM considers the 3084 a single-processor complex, customers pay only a single-processor fee for software, IBM noted.

The 3084 and 3082 Model Q will be available in the third quarter of 1983. The first 3081-G processors will be shipped later this month, the IBM spokesman said.

A 3084 processor with 64M bytes of main memory, the 3082 Model Q and a second coolant distribution unit costs \$8.7 million, according to IBM. The system leases for \$315,620/mo on a four-year plan and rents for \$394,520/mo.

Need Software For IBM System/38?

Distripak/38™ software is the ideal ready-to-run order entry and inventory control system for distribution and manufacturing operations with finished goods inventory. It is supported by a team of professionals who are specialists in System/38 business applications.

This online, "native-mode", interactive software eliminates conversion worries and uses the unique architecture and data-base facilities of the System/38.

Distripak/38™ gives you the full range of key functions in one powerful, easy-to-use package: Order Processing, Inventory Control, Accounts Receivable, Purchasing/Receiving, Sales Analysis and Mail Order operations.

Call or write today. We'll respond immediately. The sooner you install Distripak/38™, the sooner your System/38 will deliver the goods.

Softmatics Corporation, 44 Mall Road, Burlington, MA 01803, Telephone (617) 272-3420.

Copyright © 1982 by Softmatics Corporation
Distripak/38™ is a native-mode conversion of the CA-PRISMS™ System. CA-PRISMS™ is a trademark of Computer Associates International, Inc.

SOFTMATICS
CORPORATION

Corrections

ICOT Corp.'s Model 351, not Model 352 virtual terminal system, allows up to six different ASCII terminals or personal computers to emulate IBM 3270 terminals [CW, Aug. 30].

"Line of 4-, 8-Channel Muxes Features Dual Applications" [CW, Aug. 16] failed to mention that the price of Prentice Corp.'s 8-channel multiplexer is \$1,995.

In "Relational Tools Aid DP Productivity, Codd Tells Data Base '82 Attendees" [CW, Aug. 2], a list of

eight major features that a data base management system should provide was inadvertently reversed. In the article, Codd was quoted as saying that "relational systems support all of these, with some weakness in the last," which should have been the last feature listed. Instead, data storage, retrieval and update was placed last in the list, which implied that relational systems do not support these features.

Integration Right on Schedule

New IDMS Applications Modules Ready in '83

By Lois Paul
CW Staff

WESTWOOD, Mass. — Cullinane Database Systems, Inc.'s planned integration of applications and decision support software with its IDMS-1982 data base management system (DBMS) is moving along on schedule.

Last week, Cullinane announced that purchase control, cost control, order entry, master production schedule, accounts payable, accounts receivable, fixed assets, billing and pensions modules will be made available to IDMS users beginning in early 1983.

A parts list and catalog module is currently available, the vendor noted.

Application software that was slated to be tied into IDMS-1982 this

Software Eases Access to Data By 'Tell-A-Graf'

SAN DIEGO — The Data Connection, a set of four software products intended to connect computer data sources to its Tell-A-Graf computer graphics software package, was introduced today by Integrated Software Systems Corp. (Issco).

The Data Connection is intended for users of Tell-A-Graf on IBM and plug-compatible systems in MVS or CMS environments and Digital Equipment Corp. VAX-11 superminis. According to Issco, the software products can read and extract data from computer files or printer reports in any format, wherever they are stored; can link Tell-A-Graf directly to application programs; and can select, summarize, tabulate, edit and perform mathematical calculations to arrange data in a graphics presentation.

The vendor noted that the following four software products that make up The Data Connection can work independently or as a coordinated system:

- The File Connection was designed to read information stored in conventional file formats.
- Report Connection reads tabular data from reports and print files in any format.
- The External Program Connection, a set of subroutines and internal commands, directly links Tell-A-Graf software to user application programs.

• The Decision Support Connection edits, analyzes and modifies data to arrange it in a graphics presentation. Deliveries of the four products are scheduled to begin Oct. 1. Purchased together, they cost \$22,500 for IBM installations and \$15,000 for VAX installations. Purchased separately, they range in price from \$5,500 to \$9,700 each for IBM systems and from \$4,000 to \$6,500 for VAX systems.

An introductory price reduction of approximately 20% is being offered for purchases made prior to Dec. 15. Issco noted from 4186 Sorrento Valley Blvd., San Diego, Calif. 92121.

year [CW, Oct. 5, 1981] has been made available as promised. This includes the Cullinane Integrated Manufacturing System, with its inventory, material requirements planning and bill of materials modules. In addition, the previously announced Customer Information Service is now available, and a general ledger module acquired from McCormack & Dodge Corp. will be shipped beginning next month.

Payroll and personnel modules utilizing IDMS, which currently are being developed by Information Science, Inc. [CW, Jan. 11] will be available by the end of 1982.

Bob Goldman, Cullinane's execu-

tive vice-president, explained last week that "from an applications standpoint, we are creating a series of modular applications put together in a matrix in a lot of different ways to solve different problems, as opposed to having a manufacturing system or a distribution system. The information for the decision makers can be gotten from what is current within the daily run applications stored in the data base."

True Data Base Applications

"What is different about these applications," Goldman continued, "is that they won't run without IDMS, which means that they are true data

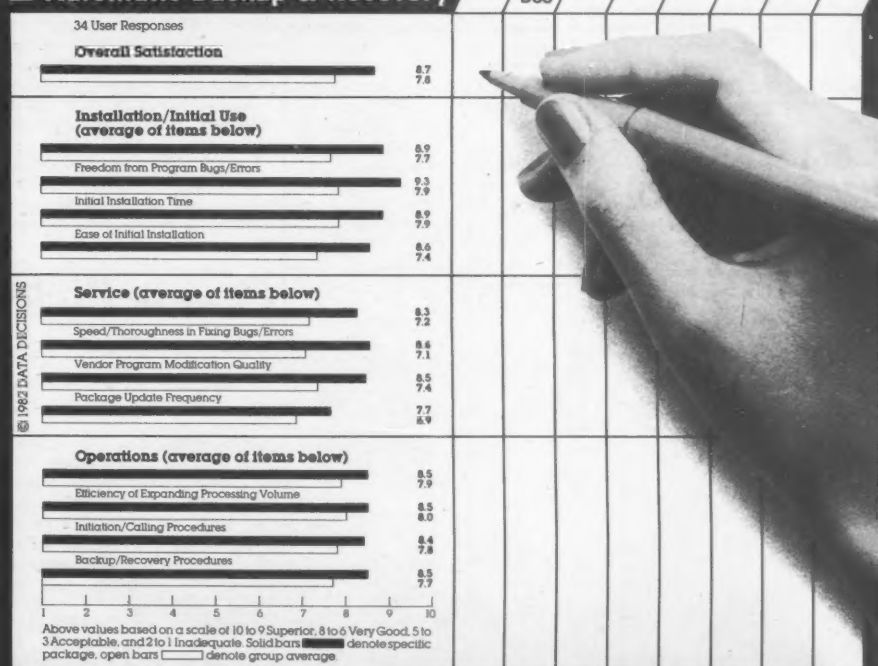
base applications. By building these applications using not only the DBMS but all the aspects of the data base — the dictionary, queries, report writers, application development tools and so on — some of the major problems that have always existed with applications, tailoring them to meet [a user's] own special requirements becomes a lot easier because the tools are underneath them."

Each applications module is priced between \$50,000 and \$75,000, Goldman noted. Cullinane Database Systems, Inc. is headquartered at 400 Blue Hill Drive, Westwood, Mass. 02090.

Are You Using the Best DASD MANAGEMENT? Compare for Yourself!

FDR ■ Compaktor

■ Automatic Backup & Recovery



49 User Responses

	Excel.	Good	Fair	Poor	MAUR*	CA**
Reliability	42	7	0	0	3.86	1
Efficiency	40	8	1	0	3.80	1
Ease of installation	34	12	1	1	3.63	1
Ease of use	35	12	2	0	3.67	1
Trouble-shooting	23	18	4	0	3.42	2
Documentation	17	31	1	0	3.33	2
User Education	7	21	11	0	2.90	2
Vendor's Maintenance	19	24	1	0	3.41	2
Overall satisfaction	36	13	0	0	3.73	1

* Mean Average User Rating on a scale of 4.0 for Excellent. ** Cluster Analysis

4200 Users
Proven Record of Reliability
Available for IBM OS/VS & MVS
60 Day Free Trial

INNOVATION
DATA PROCESSING

970 Clifton Ave., Clifton, NJ 07013-2793
201-777-1940

CALL OR WRITE FOR A COPY OF USER RATINGS

Gsat Plans Satellite Network To Underprice AT&T by 30%

By Phil Hirsch

CW Washington Bureau

STAMFORD, Conn. — GTE Satellite Corp. (Gsat) will file a tariff "within the next few weeks" for a satellite communications network that it said will offer users private-line rates 30% below those charged by AT&T. The company plans to begin commercial service before the end of the year.

The Gstar network will initially connect Chicago, Houston and Los Angeles. New York will be added early next year, according to a spokesman for the GTE Telenet Communications Corp. subsidiary. By 1984, he added, the network will be nationwide.

Data will be transmitted at 4,800, 9,600 and 56K bit/sec, earth station to earth station. The proposed rates are:

- New York to Chicago and Houston to Chicago: \$600/mo for 4,800 or 9,600 bit/sec service; \$3,000 for 56K bit/sec service.

- New York to Los Angeles: \$1,200/mo for 4,800 or 9,600 bit/sec service; \$4,000 for 56K bit/sec service.

- For the remaining three city pairs: \$900/mo for 4,800 or 9,600 bit/sec service; \$3,500 for 56K bit/sec service.

In addition to these charges, there will be a one-time installation fee and a recurring monthly

local loop charge.

Gsat contended that the rates proposed for Gstar, besides being 30% lower than those charged by AT&T, will be "lower than almost all existing tariffs of other common carriers for comparable service." A major reason Gsat can charge less, according to the company, is that its 7-meter (23-ft) diameter earth stations are located closer to the user.

The Gstar network will operate in the 12/14 GHz frequency band, which is relatively unoccupied at the moment, a company spokesman explained. He added that most existing commercial satellite services use the more congested 4/6 GHz band. As a result, these services usually must place their earth stations some distance from central business areas.

Another key feature of the new network will be the use of shared earth stations, the Gsat spokesman said.

However, a spokesman for Satellite Business Systems (SBS), also a satellite communications carrier, disputed both of these statements, pointing out that SBS offers shared services and has located its earth stations close to the central business areas in most of the cities it serves.

By 1984, Gsat expects to have 12 earth stations in place.

NAS Joins DDP Scrimmage

(Continued from Page 1)

control functions.

The DP-oriented processor supports the 370-type architecture and instruction set, while the network controller uses its own proprietary architecture and operates independently of its 4300-like counterpart, the spokesman said. The use of dual, dedicated processors enables the AS/1100's communications facilities to continue operating even if the system's DP capabilities are temporarily out of commission.

In processing power, the system is said to be roughly equivalent to the IBM 4321 and 8140. A minimum configuration incorporates 1M byte of main memory and 160M bytes of disk storage, expandable to 8M bytes and 3.2G bytes, respectively.

With the introduction of its AS/1100, NAS has reportedly gained the distinction of being the only vendor of IBM-compatible mainframes to provide a system for the fast-growing DDP sector. The product's only true competitors are the IBM 4300 and 8100 series, according to NAS.

First installed in 1979, the 8100 is geared mainly for office automation or similar applications and thus contains many features that make it easy to use, even for a relatively unskilled operator. However, the 8100 lacks compatibility with 370-series software and so is difficult to integrate into an existing IBM environment without extensive programming.

Just the opposite is said to be true of the industry giant's other DDP mainstay, the 4300 series. Though powerful and able to support existing IBM operating systems, the 4300 is oriented primarily toward programmers and thus is usually not suited to applications involving nontechnical end users.

The AS/1100 is said to combine the best features from both IBM DDP systems without suffering from any of their accompanying drawbacks. Like the 8100, the NAS machine is

reportedly well adapted to nontechnical personnel and is equipped with many ease-of-use features, including extensive word processing and data entry capabilities.

In addition, the AS/1100 requires no system generation and, if necessary, can be programmed or otherwise supported entirely from an organization's central computing installation, the spokesman said.

Like the 4300, the NAS system is also optimized to support programmers and comes with assorted software development features, including:

- Compatibility with Ansi 74 Level 2 Cobol.
- A screen mapping facility that remains independent of a user's programs.
- The ability to gain access to the distributed processing machine from any authorized point in a communications network.

Another of the AS/1100's programmer-oriented features is that the product, unlike IBM's CICS and other on-line application subsystems, integrates its transaction-processing software with its operating system. The result is that programmers can write transaction programs without having to learn CICS commands or macro-level programming skills, the spokesman said.

The merger of the AS/1100's transaction-processing capability and its operating system also eliminates a whole layer of software interface and thus minimizes the machine's operations overhead, he added.

A typical AS/1100 system configured with a 2M-byte CPU, two 160M-byte disk units, 12 CRT workstations and a 1,600 line/min printer costs \$160,000.

The system can be field-upgraded to larger members of its manufacturer's processor line and will become available in November from NAS at 800 E. Middlefield Road, Mountain View, Calif. 94043.

Goode Picks Some Winners

(Continued from Page 1)

to tonight's tilt between Dallas and the Pittsburgh Steelers. "I've got Dallas," he reported. By how much? "Probably a touchdown."

He cited the declining Steeler defense as a mitigating factor. According to him, when the team went to the Superbowl in 1978, it had allowed only 2% of opponents' passes to go for touchdowns. The following year it was 3.5%. In 1980, it was 4.5%, and in 1981 it was at 3.9%, the league average.

By contrast, in 1980 and 1981, Cowboy Quarterback Danny White scored on 6.3% and 5.1% of his passes, respectively, Goode noted. "This implies that on a key stat, there is a difference between Dallas and Pittsburgh if they play according to statistical form," he observed. "So I would say Dallas has the edge in the air."

On yards per pass attempt, Dallas also enjoys a statistical advantage. The Cowboys made 6.7 yards per attempt last year and Pittsburgh allowed 6.5, which is significantly above the league average of six, he commented.

Defensively, Dallas gave up 17.3 points per game last year, while Pittsburgh scored 22.3, a good omen for the underdog Steelers.

Goode said Dallas "should have" scored 26 points a game last season but only averaged 23. In spite of the fact that running back Tony Dorsett rushed for 1,646 yards, he only scored four touchdowns on the ground.

Meanwhile, Ron Spring, another Cowboy running back, scored 10 rushing TDs. Goode offered a possible reason: His contacts in Dallas tell him that they didn't give the ball to Dorsett in goal line situations.

Goode also noted that the Cowboys' touchdowns rushing per game fell, relative to the league, more than any other team, from 1.6 to .9 between 1980 and 1981.

"They were over league average in that stat in three games out of 16," he added.

Goode advised *Computerworld* readers to watch the fleet-footed Dorsett closely tonight. "I think that in the first Monday night game, we're going to want to see if Tony Dorsett scores on the ground," he said.

Informatics Regional Courses

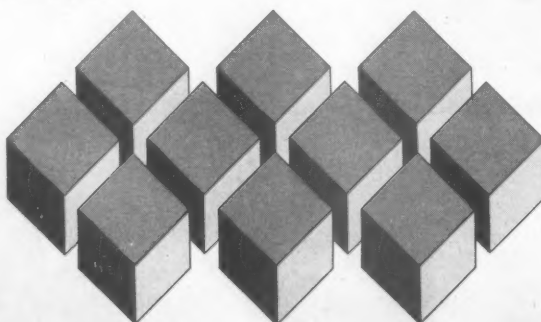
Expert Instruction From Informatics

Until recently Informatics General Corporation has offered its unique approach to education primarily in private classes to major organizations. Now, we are making the same quality education available in public classes throughout the West. Each class features a senior Instructor/Consultant who adds his "real world" expertise to Informatics proprietary material. The result is training that works. Call Jo Ann Turner in Palo Alto (415) 964-9900 to reserve a seat or to ask about education at your site for groups of 8 or more.

Informatics
general corporation

Attention: Jo Ann Turner
1121 San Antonio Road
Palo Alto, California 94303

San Francisco	
IMS Message Format (220)	Nov. 1-Nov. 3
IMS Programming Series	Dec. 6-Dec. 10
Los Angeles	
IMS Master Technical Course	Sept. 27-Oct. 7
Master Terminal Operations	Oct. 25-Oct. 28
CICS	Nov. 1-Nov. 5
ADF For IMS (includes lab)	Nov. 8-Nov. 12
Houston	
CICS	Sept. 20-Sept. 24
IMS Message Format (220)	Oct. 11-Oct. 13
IMS Programming Series	Nov. 15-Nov. 19
IMS Message Format (220)	Nov. 22-Nov. 24
Master Terminal Operations	Nov. 29-Dec. 2
IMS Advanced Topics	Dec. 13-Dec. 17
Dallas	
Master Terminal Operations	Sept. 20-Sept. 23
VSAM	Oct. 18-Oct. 22
IMS Programming Series	Nov. 1-Nov. 5
ALC (LIFE COMM)	Nov. 8-Nov. 12
IMS Advanced Topics	Nov. 8-Nov. 12
ADF For IMS (710)	Nov. 29-Dec. 2
CICS	Dec. 6-Dec. 10
Master Terminal Operations	Dec. 6-Dec. 9
Portland	
CICS	Oct. 11-Oct. 15



The highest level query language is one you already know... ENGLISH

```
PRINT LNAME, 82-SEP-ACT-SALES, 82-SEP-EST-SALES,
      82-SEP-ACT-SALES - 82-SEP-EST-SALES,
      (82-SEP-ACT-SALES + 82-SEP-EST-SALES) / 82-SEP-ACT-SALES
```

```
IF REGION = 'NEW ENGLAND AND
82-YTD-ACT-SALES < 82-QUOTA
```

I WONDER HOW ACTUAL SALES FOR LAST MONTH
COMPARED TO THE FORECASTS FOR PEOPLE UNDER QUOTA
IN NEW ENGLAND.

NAME	1982 SEPTEMBER SALES	1982 SEPTEMBER ESTIMATED SALES	CHANGE	% CHANGE
SMITH	\$52,570	\$55,064	2,494	4.53
JONES	\$83,596	\$85,360	1,764	2.07
ALEXANDER	\$52,546	\$55,483	2,937	5.29
ADAMS	\$53,837	\$56,357	2,520	4.47
McNEIL	\$95,760	\$96,929	1,169	1.21
McKAY	\$36,448	\$39,694	3,246	8.18
BERGER	\$85,691	\$90,515	4,824	5.33
COLONDER	\$75,762	\$77,448	1,686	2.18

**Before Intellect™,
you had to use a complicated
query language like this**

**With Intellect™,
all you do is type a simple
question—any way you want**

Intellect is the only true English-language query system. It enables users to question the computer in everyday, conversational English.

Other query and retrieval systems claim this ability, but prove to be merely English-like. They require a thorough knowledge of special syntax, complex query sequences, and rigid formats and codes before a user can retrieve any meaningful data.

Intellect, however, employs the technology of Artificial Intelligence to understand even the complex pronoun references and incomplete sentences that we all use in conversational English. Executives can access data themselves—more easily than ever before—without learning any jargon or “computerese.” It’s so easy to use it doesn’t even have a training manual!

All the user has to do is type in a simple question in plain, informal English. Intellect almost instantly translates the request and optimizes the retrieval of data from the database. The answer will appear in seconds.

Executives don’t have to wait for information, and the DP department is freed from having to respond to management’s requests for reports. Tedious, repetitive report generation becomes a thing of the past.

Intellect isn’t just for simple questions. The system can relate information from several files to respond to a query, so that a request doesn’t have to be confined to a single file. Users can compare different sets of data with one question, as when comparing actual sales figures with projections. Managers make better decisions with all this information instantly available at their fingertips.

Many non-DP people think it’s always been this easy to get information from a computer. That’s why they get so frustrated when they discover that they have to learn a complicated formal query language in order to retrieve the

data they need. If they have any experience working directly with a computer, they’ll be amazed and relieved at how easy it is to use Intellect—even to get the answers to complex questions. Intellect makes the computer the easy-to-use tool it should have been long before now.

Eighteen months ago true English-language data retrieval was not even possible in everyday commercial applications. Although Intellect is a recent and dramatic development, it is already hard at work at over 100 installations in Fortune 500 companies. It has been hailed by publications such as *Business Week* and *Fortune* as the first product to put Artificial Intelligence to practical commercial use. Intellect is used in a wide variety of businesses, such as manufacturing, banking, insurance

and retailing—because the system incorporates a lexicon tailored to the way your company does business.

Intellect’s ability to understand English is so unique that leading software companies have arranged to integrate it into their product lines. Intellect is marketed by Cullinane Database Systems under the name “On-Line English.” Management Decision Systems offers Intellect as “ELI—English Language Interface.” Information Sciences markets Intellect as “GRS Executive.” Intellect also interfaces directly to ADABAS, IDMS and VSAM, as well as dealing with sequential files.

You don’t have to learn a complex formal language to talk to your computer any more. Intellect already speaks your language. We’d be delighted to hear from you.



*Richard Bibaud,
Vice President, AVCO Corporation's
Systems Division, was immediately able
to use Intellect's plain English capability to re-
trieve information from his company's computer.*



ARTIFICIAL INTELLIGENCE CORPORATION
200 FIFTH AVENUE WALTHAM, MASS. 02254 (617) 890-8400

EMPTY SHELL SITES

Company	Sites	Size (Sq Ft)	Membership Limit	Usage Fee	Maximum Usage Period	Mailing Address
Data Processing Security, Inc.	Fort Worth, Texas	33,000	35	\$1,000/Mo for 7 Years	No Maximum Limit Unless Other Disasters Occur	Data Processing Security, Inc. 200 E. Loop 820 Fort Worth, Texas 76112
	Indianapolis	16,000	15	\$1,500/Mo for 7 Years		
Data Shield, Inc.	Greendale, Wis.	5,400	80	\$1,800/Year Small Users \$2,400/Year Larger Users	8 Months	Data Shield, Inc. P.O. Box 242 Greendale, Wis. 53129
	Bayview, Wis.	16,200	80	\$1,800/Year Small Users \$2,400/Year Larger Users	8 Months	
Eloigne Corp.	St. Paul, Minn.	28,800	60	\$1,200/Mo for 1 Year \$1,000/Mo for 3 Years \$900/Mo for 5 Years \$800/Mo for 7 Years	9 Months	Eloigne Corp. c/o Northern States Power Co. 414 Nicollet Mall Minneapolis, Minn. 55401
Emergency Computer Center, Inc. (ECC, Inc.)	Lenexa, Kan.	13,500	25	\$750/Mo — \$1,500/Mo, Depending on Space & Utilities Needed	6 Months	ECC, Inc. 10012 Darnell Lenexa, Kan. 66215
Western Southern Life Insurance Co.	Cincinnati	8,000	19	\$1,000/Mo	6 Months	Western Southern Life Insurance Co. 400 Broadway Cincinnati, Ohio 45202
Wright Line, Inc. Data-Site	Rhode Island	12,000	60	\$12,000/Year Lump Sum	6 Months	Wright Line, Inc. 160 Gold Star Blvd. Worcester, Mass. 01606
	North of New York City	8,091 Underground	60	\$12,000/Year Lump Sum	6 Months	

CW Chart

Hot Sites More Prevalent

Disaster Recovery: Some Like It Hot, Others Cold

By Marguerite Zientara
CW Staff

For those convinced of the need for disaster recovery contingency plans, *Computerworld* has examined some commercial offerings of "hot sites" — fully equipped computer centers — and "cold sites" — empty shells in which you can install your own computer equipment.

The companies listed in the charts here are a representative sample of what is available in the U.S.; it should not be regarded as a complete list. The firms mentioned are those visited annually by Jerry Isaacson, director of the Educational Resource Center of the Computer Security Institute in Northborough, Mass.

Only one firm contacted requested that it not be mentioned in this report. The St. Louis-based cold site has "all the business [it] can handle," according to a spokeswoman.

The disaster recovery industry, which is just "starting to grow," according to Isaacson, offers almost twice as many hot sites as cold around the country.

Besides the amenities indicated in the

Product Spotlight

charts, hot sites feature security, fire protection and telecommunications capabilities, to varying degrees. Security generally is very elaborate, including such things as card entry systems, 24-hour guards, motion detection systems, water sensors and/or closed-circuit television.

Fire Protection

Fire protection comes in the form of heat sensors under the floor, smoke and fire detectors, wet or dry pipe sprinklers and/or Halon extinguishers. Telecommunications capabilities generally offer data rates up to 9,600 bit/sec on as many as several hundred phone lines.

The empty shells feature enough power, water cooling and air conditioning to run a large-scale mainframe. The empty shells' telecommunications capabilities are comparable with those of the hot sites, as are their security and fire protection measures.

But where does the computer equipment come from for a cold site? The user must make arrangements with its vendor for quick delivery of replacement equipment in case trouble occurs.

It is noteworthy that the length of time for which a user can run its equipment at a cold site is in most cases negotiable, depending on circumstances. While hot sites generally are stricter on their maximum usage periods, a number of vendors indicated users could stay indefinitely "unless there's another disaster."

Computer Alternatives, Inc. offers, in addition to its two New Jersey hot sites, a "matching" service for companies interested in "pseudo-mutual-aid agreements." Instead of the two companies pledging their facilities for each other's emergency use, Computer Alternatives arranges for only one firm to promise emergency facilities, secured by cash rather than a return pledge of assistance.

Computer Alternatives matches firms having contingency needs with compatible installations that have excess capacity. It conducts regular testing of the contingency plan and makes sure the operations remain compatible.

With 38 host sites and more than 30 clients, Computer Alternatives charges \$1,200/mo to \$2,000/mo for its matching service. It claims to have handled 15 disasters over the last five years, ranging from "an employee who poured half a gallon of sulfuric acid down a CPU" to a 10th-floor flood caused by broken pipes, according to its president, Joseph Zein.

Another option — for Honeywell, Inc. users — is the Crashgard service from CRA, Inc. of Phoenix, which promises to hold equipment on standby and ship it to a disaster site "anywhere" within 24 hours.

Fees vary depending on the equipment desired, a spokesman explained. For a Level 66/20 with 256K bytes of memory, three disk drives, tapes, card reader and printer, the cost is \$1,500/mo on a three-year contract. Users are billed annually in advance.

ARE YOU PAYING TOO MUCH FOR YOUR IBM PERIPHERAL EQUIPMENT?

IBM Equipment	IBM Net MLC	CMI Price*	Per Unit 24 Month Savings
3333-11	\$2,656	\$491	\$51,960
3330-11	2,224	442	42,768
3420-7	519	245	6,576

*Based upon a 24 month lease

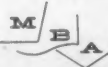
Shorter term as well as month-to-month leases are also available. CMI can replace installed equipment on IBM MLC. All penalties & installation charges can be covered by CMI.

CMI CORPORATION
Call Tim Ryan
(313) 362-1000

BRYCE'S LAWS ON INFORMATION SYSTEMS

"Systems are built by evolution,
not by revolution."

This is one of the laws embodied in the "PRIDE"-Automated Systems Design Methodology. "PRIDE"-ASDM is an integrated and automated approach for engineering and manufacturing Information Systems. It is a straight forward business approach that is governed by the inherent principles of systems design & development. For more information on "PRIDE"-ASDM and a free poster on "Bryce's Laws", write:



m. bryce & associates, inc.
1248 Springfield Pike • Cincinnati, Ohio 45215
Tel: 513/761-8400

"Software For the Finest Computer-The Mind."

Fully Equipped Backup Sites

Company	Computer & Memory	Disk Storage	Tape Drives	Size (Sq Ft)	Uninterruptible Power System (UPS)	Membership Limit	Usage Fee	Minimum/Maximum Usage Period	Shell Available	Address
Arbat Systems Ltd.	Four DEC PDP-11/70s (256K Words)	200M Bytes Each	6	2,500	No	4-Hour Response: 10	\$300/Mo Minimum	6 Weeks Maximum	1,000 sq ft	Arbat Systems Ltd. Arbat Plaza Hoboken, N.J. 07030
	11/23 - 128K Words	40M Bytes				12-Hour Response: 12				
	11/24-256K Words	40M Bytes								
	11/40-128K Words 11/44-256K Words 11/780-2M Bytes	150M Bytes 210M Bytes 200M Bytes								
Comdisco Disaster Recovery Services, Inc.	Chicago; Cranford, N.J.	13.83G Bytes	16	Chicago: 37,800 Cranford: 17,000 Lodi: 18,000	No	100/Site	158-\$1,500/Mo 168-\$2,000/Mo 168AP-\$3,000/Mo	6 Weeks Maximum For Hot Site 1 Year Maximum For Shell	4,000 sq ft All Sites	Comdisco Disaster Recovery Services, Inc. 6400 Shafer Court Rosemont, Ill. 60018
	Lodi, Calif. (Same Specs)									
	IBM 370/158 Model 3 (2M Bytes)									
	370/168-I (8M Bytes) 370/168-AP3 (8M Bytes)									
Computer Alternatives, Inc.	Elmwood Park, N.J. Univac 1100/82 (4M Words)	16M Bytes	6	4,000	No	36	\$3,000/Mo— \$12,500/Mo	8 Weeks Guaranteed Minimum	1,000 sq ft	Computer Alternatives, Inc. 555 Goffle Road Ridgewood, N.J. 07450
	Lodi, N.J. IBM 4341 Group 2 (4M Bytes)	3.5G Bytes	8	7,500	Yes	15	\$2,000/Mo— \$4,500/Mo	8 Weeks Guaranteed Minimum	2,000 sq ft	
	Acme Chain Division Of Incom International Corp. Holyoke, Mass. IBM 4331 Group 2 (2M Bytes)	2.3G Bytes	2	1,000	No	20	\$1,000/Mo— \$2,000/Mo	8 Weeks Guaranteed Minimum	No	
	Cadre, Inc. Avon, Conn. Burroughs B4890 (800K Bytes)	130M Bytes	6	7, 10	No	24	\$2,000/Mo	8 Weeks Maximum	1,000 sq ft	
Litton Systems, Inc. Mellonics Information Center	IBM 3033 (12M Bytes)	12.7G Bytes	14	3,400	No	80	\$2,000/Mo— \$4,000/Mo	6 Weeks Minimum	No	Mellonics Information Center 6701 Varrel Ave. Canoga Park, Calif. 91303
NVIP, Inc. Systems Available For Emergency (Safe)	IBM 3033 (12M Bytes)	11.76G Bytes	12	10,000	Yes	100/CPU	\$1,000/Mo Minimum	8 Weeks Maximum For Hot Site	14,000 sq ft	NVIP, Inc. 4850 Street Road Trevose, Calif. 19049
	IBM 370/158AP (6M Bytes)						\$2,500/Mo Average	6 Months Maximum For Shell		
Remote Computing Corp.	Burroughs B7800 (6M Bytes)	5.5G Bytes	8	8,000	No	27	\$500/Mo— \$3,500/Mo	60-90 Days Minimum 6 Months Maximum	5,000 sq ft	Remote Computing Corp. 1076 E. Meadow Circle Palo Alto, Calif. 94303
Software Research Corp.	IBM 4341 Group 1 (4M Bytes)	3.81G Bytes	3	1,800	No	12	\$1,500/Mo	1 Year Minimum Contract	No	Software Research Corp. 140 Gould St. Needham Heights, Mass. 02194
	IPL 4446 Group 2 (8M Bytes)									
Sun Information Services Co. Sungard	Philadelphia I: IBM 3031 (4M Bytes)	508M Bytes	16	98,500 Philadelphia Total	No	80	\$3,000/Mo— \$5,500/Mo On 3 Year Contract	6 Weeks Maximum For Hot Site 6 Months Maximum For Shell	5,000 sq ft Philadelphia Total	Sun Information Services Co. 656 E. Swedesford Road Wayne, Pa. 19087
	II: IBM 3033 (12M Bytes)	1.52G Bytes	20		No	80				
	Chicago: IBM 3033 (12M Bytes)	1.52G Bytes	20	40,000	No	110			5,000 sq ft Chicago	
Sysgard, Inc.	Honeywell DPS 442 (2M Bytes)	2.4G Bytes	4	2,700	No	40	\$3,000/Mo For 1 Year \$2,750/Mo For 2 Years \$2,500/Mo For 3 Years	90 Days Maximum	No	Sysgard, Inc. P.O. Box 1106 Owensboro, Ky. 42302

CW Chart

How Would You Recover From a DP Disaster?

(Continued from Page 1)

systems in which the only permanent records are those stored within a computer."

The study, whose results were reported in April as a publication titled "Computer Disasters and Contingency Planning," examined two dozen large companies in North America and Northern Europe. It found that nearly half had no formal backup arrangements of any kind.

With or without backup, data centers face threats from fire, smoke and noxious fumes, explosion and impact, flood and earthquake, loss of essential services, loss of key staff, terrorist attack or sabotage, the study said.

Losses manifest themselves in a number of ways: Direct financial

losses result from destruction of equipment and facilities, loss of sales and loss of production. Indirect financial losses include long-term loss of customers, extra payments to staff, uncollected receivables, undetected fraud and payment of fines and damages.

Loss of control over vital aspects of the business can mean loss of the integrity of one's data or erroneous business decisions.

What can a data center do to guard against such losses?

• One alternative is to do nothing, which may be a "perfectly acceptable answer for a great many companies,"

Product Spotlight

according to the Butler Cox study. "By 'doing nothing' we mean taking out the appropriate forms of insurance, then accepting the risk that the computer system may be disabled for a considerable period, with all the inconveniences that would result."

The advantages of doing nothing lie in the cost, which is "next to nothing," the report pointed out. "It also saves management time ... and it may avoid having to hire extra staff."

The disadvantage of following this course is the "genuine risk of business collapse and/or bankruptcy in the event of a full-blown disaster."

• Another alternative of disaster planning is the "fortress" approach, in which a firm places "all its eggs in one well-defended basket, in the form of a single fortress-like computer center," the Butler Cox said. Such centers have full redundancy in their hardware, good environmental controls and tight physical security.

While not cheap, the "fortress" approach costs less than any of the multicenter alternatives. The savings are in rent, facilities and staff. Other advantages are in ease of control and guaranteed security.

Again, however, the disadvantage of such a system is the possibility that "despite the best security, the entire center may be taken out of action by some types of disaster, such

(Continued on Page 12)

What's Available in Disaster Recovery Sites

(Continued from Page 11)

as a major flood, toxic chemical spillage or large-scale terrorist assault."

• Another major option, not mentioned in the Butler Cox report, is the commercial "hot site," which offers lease terms for an operational computer and peripherals, disk storage, telecommunications, environmental controls and security (see story on Page 10).

• The third option considered in the Butler Cox study is the "cold" backup service, or empty shell approach. This service offers lease terms on a site with no computer with sufficient electrical power, air conditioning and telecommunications to support one. Each subscriber to such a service pays an annual fee for the right, in the event of a disaster, to set up its computer in the center for a limited period of time — provided no other user is already there. Additional fees may be charged for the time the user actually occupies the center.

The cold site's advantages are its relatively low cost and high security. "For most companies, such a service is the cheapest way of obtaining a second computer center," the study said. "The subscription fee is a fraction of what a purpose-built building, equipped to the same standard, would cost."

Since the cold site is likely to be lo-

cated at some distance from its customers, it is not likely to be affected by the same natural disasters, the report pointed out.

A cold site's disadvantages lie in "time scale," restrictiveness, shared membership and undercapacity, according to the report. By "time scale" the report means the difficulty in replacing lost hardware, especially custom-made equipment or equipment from manufacturers who have gone out of business.

The study found that most cold site agreements give a maximum of six weeks' use of a center, after which the user must vacate the premises, necessitating yet another move and more time lost.

Shared membership causes problems if a user needs a site only to find that someone else has moved into it. (However, some U.S. cold site suppliers indicated to CW that they can handle more than one user.)

Lastly, while a user makes sure the cold site will fit his needs during the initial subscription period, "it is all too easy to outgrow this... capacity gradually over time without realizing it," the study indicated.

• The report also discussed an option that does not exist in the U.S. — that of portable, prefabricated backup centers erected on a user-provided site in the event of a disaster. The advantage of this, option is its sim-

plicity. The disadvantages are finding space to erect a building; lack of air conditioning, heating or water cooling; obtaining equipment; and security.

The closest thing to a portable center in the U.S., according to Jerry Isaacson of the Computer Security Institute in Northborough, Mass., is the willingness of Randolph Engineering Corp. in Austin, Texas, to make available its product — trailers with air conditioning and raised floors — in an emergency.

• A fifth alternative is a "warm" backup service, according to the Butler Cox study. Warm backup refers to a contract with a service bureau to use its center in the event of a disaster. The user is also normally allowed to store backup copies of files and programs at the center for use in an emergency.

This is a time-saving alternative and offers good environment and security as well. The disadvantages are high cost; restrictiveness of use; potential capacity and compatibility problems; and lack of arrangements for any special requirements.

• The sixth choice considered by the report is that of mutual backup arrangements, in which two companies with similar DP configurations agree to back each other up if a catastrophe occurs. The companies are usually located near each other but are in different industries so as to eliminate risks to competition or confidentiality.

The advantages of such systems lie in low cost, flexibility and reliability

and security. Disadvantages include the task of finding a partner, possible legal and contractual problems, capacity and system compatibility over time.

• The seventh option considered by the report is the private cold site, whereby a firm sets up its own empty computer facility with sufficient security and environmental controls at a safe distance from its primary site.

Such a site offers guaranteed access, relatively low cost (few ongoing costs and no extra staff), flexibility and no compatibility problems. The disadvantage — as with a commercial cold backup service — is time scale. "Although the private cold center itself can be activated immediately, the problem still remains of obtaining and installing the necessary... equipment quickly after a disaster," the report stated.

• The last option examined by the study is a private warm backup site, an approach that spans a wide range of options. Choices range from "having a cold center in which hardware is installed but left idle, to establishing a complete duplicate computer installation" running the same work load as the primary center and which can be "switched into service instantly."

The advantages of such a system are time scale, alternative uses (software development) and reliability. The major disadvantage is the high cost (this is the most expensive alternative) and possible loss of management and control, the study said.

NOT ALL CICS AND VSAM COURSES ARE ALIKE.

OUR HANDS-ON VS. THEIR HANDS-ON.

SysEd students spend fully one third of class time in actual hands-on workshop sessions with our IBM 4341/II—unlike some courses where you're lucky if you even see a computer. Under the guidance of our highly qualified instructors, our students work at their own terminals, coding and running real life programs—not oversimplified "sample programs." With our limited class size, all students receive the individual attention they need, and can bring in programming assignments, debugging or design problems to the workshop sessions.



WE WROTE THE BOOK.

SysEd course manuals are the best in the industry. They are comprehensive guides and programming models written especially for each course by our experienced instructors. They are thorough, clear, and well organized, and serve as desk-top references long after the course. Our manuals are constantly updated to include new versions and more efficient programming methods.

ALL OUR TEACHERS ARE TEACHERS. All SysEd instructors combine academic skills with broad practical experience in the business environment. They know

programming, and they know how to teach it. In the classroom, they teach not only "how to," but "why," building a solid foundation in fundamentals and insights into advanced materials. Because teaching is a full-time commitment, there are no part-time instructors on our staff. When they're not in the classroom, they're busy writing or updating course manuals, improving techniques, even developing new courses. And they're available to students after the course for additional advice or support.

TEACHING IS OUR ONLY BUSINESS.

Most computer training companies are divisions of large software companies or service bureaus. Not SysEd. Our only goal is to provide top-quality computer training for highly motivated professionals—no more and no less. Because we're independent, we're free to concentrate on teaching—and we do it very well.

OUR PLACE OR YOURS?

SysEd's courses are held weekly and on weekends at our modern, fully-equipped computer centers in New York City, Chicago and San Francisco. Or, if you prefer, we'll arrange on-site courses at your own computer installation. On-site courses can include the same case studies and hands-on approach as our public courses, or can be customized to your particular application or project. SysEd courses include CICS Command Level, Macro Level, Internals, Application Design, Performance Design and VSAM.

Classes are limited. For early enrollment or more information call Dave Shapiro (212) 882-3386.

SYS-ED™

ONE PARK AVENUE, NEW YORK, NY 10016 • (212) 889-3386

SERVICING MIXED-VENDOR COMPUTER SYSTEMS NATIONWIDE

Save Up To 50% On Kalbro's New Introductory Service Program

Kalbro Corporation, one of the largest independent, nationwide computer-maintenance companies, announces a new service program for mixed-vendor computer systems.

Now, you can save up to 50% on your present service cost with this special introductory offer... good until November 30, 1982.

With 47 field service centers and three depot repair facilities, Kalbro offers you rapid response and fast repairs.

With Kalbro, you're assured of thoroughly professional service, quality maintenance, and cost-effective results. Why settle for less when you can get the best at lower cost?

Send us a list of your equipment and we'll be happy to send you a quote. Or call for faster response. Discover how our new mixed-vendor system service program can save you up to 50% on your computer maintenance.

KALBRO corporation An IAL Company

Eastern Region
101 Foster Road
Moorestown, NJ 08057
(609) 778-1800

Central Region
772 N. Church Road
Elmhurst, IL 60126
(312) 279-1960

Western Region
1160 Sandhill Avenue
Carson, CA 90746
(213) 637-1513

KALBRO CORPORATION An IAL Company CW 9/13

101 Foster Road, Moorestown, NJ 08057 (609) 778-1800

YES, I'd like to compare your prices on mixed-vendor service maintenance. I have attached a list of my equipment.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Could Become Law by Default

Calif. Tax Bill Would Exempt Custom Software

By Jeffry Beeler

CW West Coast Bureau

SACRAMENTO, Calif. — Gov. Edmund G. Brown Jr. has until Sept. 30 to decide whether to sign into law a bill that would exempt custom programs from California sales tax.

Assembly Bill (AB) 2932 landed on the governor's desk on Aug. 30, shortly after clearing its final legislative hurdle in the state Senate.

Under California law, Brown must act on the proposed legislation within 30 days after it arrives in his office. Otherwise, the bill automatically becomes law.

Whether AB 2932 will ultimately win the governor's signature is still the subject of intense speculation. Brown is said by some local sources to have threatened to veto the bill on the grounds that it might deprive the state of sorely needed revenue.

But other sources estimate that the bill's chances of passage are slightly better than 50%. At least one AB 2932 supporter expects Brown simply to defer action on the proposed legislation and thus allow it to become law by default.

Introduced Last March

Introduced last March 2 by state Assembly Ways and Means Committee Chairman John Vasconcellos (D-San Jose), the bill would exempt California's software suppliers from having to pay sales tax on any program written to a single user's unique specifications.

Until the mid-1970s, efforts to collect California sales tax from suppliers of custom programs were virtually unknown, according to Intellidata, Inc. President Ron Carpenter, who also represents the Software Services Association, an industry group favoring AB 2932's passage. But when programs began to be increasingly implemented on magnetic media, the push for collections abruptly intensified.

Since then, the state has adopted a policy requiring all vendors of custom software to add a 6% to 6½% surcharge to the price of every product they sell to their customers. The surplus revenue is then supposed to be collected from the buyers and turned over to the state treasury in the form of a sales tax.

To ensure compliance with the regulation, the state's Board of Equaliza-

Dema Conference Slated for Oct. 4-6

NEW YORK — The sixth annual Data Entry Management Association (Dema) Conference and Exhibition will be held Oct. 4-6 at the Sheraton Center here.

The conference will cover topics relating to management techniques, new technologies and new opportunities for the future. Panel discussions will focus on an executive forum, centralized vs. distributed processing, participative management, new technologies and the office of the future.

Registration fees are \$350 for members and \$395 for nonmembers. Dema can be reached at P.O. Box 3231, Stamford, Conn. 06905.

tion runs periodic spot-checks on selected custom programs' suppliers and demands that the firms make their sales records available for special audits. A number of such companies have already been audited and have been found to owe the state several years worth of back sales taxes totaling tens or even hundreds of thousands of dollars.

Many other custom-software suppliers have managed thus far to escape the auditors' attention, but live in constant dread that someday they, too, may be scrutinized and will be ordered to pay massive deficiency assessments, Carpenter said.

If AB 2932 becomes law, California-

based suppliers of custom programs would be immediately forgiven for failing to collect back sales taxes and would be relieved of their responsibility to pay any outstanding deficiency assessments.

The bill also contains a clause that says, in effect, that providers of custom programs should never have been required to collect sales taxes in the first place. In theory, the provision would give any custom-software company that had already been forced to pay sales taxes the option to apply for a full refund.

At least one AB 2932 opponent, Board of Equalization Chairman William Bennett, has warned the already

financially troubled state that the refunds might eventually total as much as \$90 million.

Bennett's dire predictions prompted some government administrators here to voice serious reservations about the bill, which had already worked its way through both houses of the state legislature. Shortly after it was sent to Brown's staff for final consideration, the proposed law was returned to the state Senate with a request for some last-minute revisions.

The maneuver resulted in the addition of an amendment that would limit the total amount of the state's sales tax refunds to \$1.2 million.

Decision Support Systems...

a Quantum Leap in Financial Planning.

EMPIRE...

a Quantum Leap in Decision Support Systems.

Decision Support Systems have revolutionized corporate and financial planning. A DSS is now routinely used to help make critical decisions—whether to acquire another company, launch a new product, or change a price. Ease of use has enabled planners—and even CEO's—to do their own analysis, ask their own "what if" questions and develop their own color graphs for presentation.

EMPIRE[®] from Applied Data Research is a new generation of Decision Support System. Designed to run on IBM or DEC equipment*, EMPIRE takes advantage of the special efficiencies of each operating system it runs on. And EMPIRE ensures faster model solution by generating true compiled code.

*EMPIRE is designed to run on the IBM 370, 303x, 4300 or plug-compatible machines, with VM/CMS, MVS/TSO, or MVS/ROSCOE operating systems; or on all VAX processors, the DEC-20 and DEC-10.

EMPIRE[®]



APPLIED DATA RESEARCH

EMPIRE Information Center, Route 206 Center, CN-8
Princeton, New Jersey 08540

Telephone: (609) 921-3070

EMPIRE is a registered trademark of Applied Data Research, Inc.

Color graphics, reporting, data management, modeling, statistical analysis, "what if" analysis—these capabilities are integrated in EMPIRE, providing the most complete planning system available. EMPIRE's power and sophistication will meet your planning needs today... and tomorrow. It's the *only* system you will ever have to buy.

EMPIRE is from ADR[®]—a recognized leader in software and technical support since 1959. ADR offers such user backup as: the EMPIRE Hotline, Technical Support Staff, ongoing beginner and advanced training, frequent product updating, and complete documentation.

With over 50 offices worldwide, ADR is there when you need help—saving you time and money.

For further information about EMPIRE, send in this coupon to:

Applied Data Research, Inc., EMPIRE Information Center
Route 206 Center, CN-8, Princeton, New Jersey 08540

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

PHONE _____

Manual Tells How to Hire Handicapped DPer

By Bob Johnson

CW New York Bureau

NEW YORK — A "landmark" manual that describes how to hire the handicapped as computer programmers has been developed by a corporate communications specialist at Manufacturers Hanover Trust Co. (MHT) here.

Michael Krawetz, a DP documentation writer and journalist who used DP flowcharting methodology to write a previously published self-help "Self Esteem Passport" [CW, April 6, 1981], has mustered his computer savvy once again for a personnel guidebook. The Human Resources Center of Long Island described the book as "a landmark in the development of awareness among management persons and major corporate employers of the proper ways in which the sizable pool of computer programmer resources in the disabled population may be tapped."

The manual's concept became reality after MHT discovered that it needed management orientation in hiring and training the handicapped to serve as programmers, Krawetz said. Because Charles D. LaBelle, vice-president of human resources at the company, knew of Krawetz's work in applying flowcharting to publishing, he assigned the DPer to the task.

"Work on the manual began about a year ago, and it falls right in line with MHT's pioneering efforts in hiring the handicapped," Krawetz said. "The company has spent tens of thousands of dollars for braille terminals and on training the management force in recognizing the handicapped as a talented resource for DP," Krawetz said.

No Other Manuals

During his research for the manual, Krawetz approached nearly every organization in existence that offers aid in employment for the disabled and said he was unable to find a single manual that documented the hiring, training and placing of handicapped people in the DP field.

"To date I have talked to thousands of corporations who, to my disbelief, refuse to hire handicapped programmers. They just don't want to be

bothered. I think a lot has to do with the fact that they are ignorant as to the precious human resource these people are, and how they can become a valuable asset in the DP work place," he said.

Krawetz described the handicapped population as the DP job resource of the '80s and said many companies that are experiencing a shortage of DPer would do well to turn to them for help. He pointed out that the disabled represent the lowest turnover rate of any category in DP and stay on the job an average of seven to 10 years.

Open Door

The human resources guidebook is written in a manner that non-DPer

as well as DPer can understand. "This manual should open the door for tens of thousands of disabled persons who want to work as programmers," he claimed.

The manual is compiled from research that included interviews with many MHT handicapped DPer, which Krawetz feels gives the book more insight than traditional manuals. Tony Ferrita, a visually handicapped MHT programmer with three years of DP experience, described his experience in the manual.

Topics discussed in the manual include: "Interviewing Disabled Programmer Job-Applicants," "Visually-Impaired Programmers From Another Perspective," "Computer Training Programs for the Blind,"

"Specialized Equipment Directory for the Visually-Impaired Who Work as Programmers," "Supervising the Handicapped Programmer" and "Hearing-Impaired Programmers at MHT."

The 200-page-plus comprehensive manual also includes illustrations, references and a glossary. In the section on specialized equipment, for example, Krawetz discusses the ins and outs of computer hardware for the handicapped from braille terminals and printers to talking calculators.

The manual will be available by the end of the year, according to Krawetz. Those interested in the manual can contact Vice-President LaBelle at MHT in New York.

INTRODUCING MODEMS AT LOW



LSI E9600
LSI E9604
LSI E96/V.29

9600 bps, from \$2650

Course to Cover Data Security

PALO ALTO, Calif. — "Cryptography and Data Security," a three-day seminar conducted by Hellman Associates, Inc., is slated for three major U.S. cities: Los Angeles, Nov. 3-5; Palo Alto, Feb. 7-9; and Boston, May 4-6.

Seminar leader Martin Hellman, a professor of electrical engineering at Stanford University, will discuss the latest methodologies in data security and preventing computer crime. Hellman, who is known for his invention of "public key" and "trap door" encryption methods, was recently elected a fellow of the Institute of Electrical and Electronics Engineers for his contributions.

Seminar registration costs \$795. Hellman Associates is at 299 California Ave., Palo Alto, Calif. 94306.

Who Owns Information DPers Create? Lawyer Sees Trade Secrets Suits Escalating

By Bob Johnson

CW New York Bureau

NEW YORK — Do DPers who work for computer vendors "own" the technological information they help create or learn on the job? And, more importantly, can they use what they learn at a future job?

These questions, which have been plaguing the computer industry for some time, are becoming manifest in a rash of legal battles between computer vendors and employees, according to Alvin M. Stein, senior litigating partner at the New York law firm of Parker, Chapin, Flattau & Kimpl.

Stein said in an interview here that

the two major areas causing concern in both the legal field and the computer industry are formally known as noncompete restrictions and proprietary trade secrets.

Noncompete restrictions are usually agreements between an employer and employee that prohibit the employee from using any product knowledge he has gained at a competing company at a later date. The information itself is often considered a trade secret by the employer.

'Fertile Ground'

The computer industry has become "fertile ground" for litigation centering on DPers' rights and companies'

rights concerning technological information and developments, Stein said. "Computer cases are becoming particularly appropriate concerning noncompete restrictions because the nature of the business involves the creation of a product which may not be generally or widely known," he explained.

Because computer products or services are so unique, it is often difficult to determine just what was developed by whom and how it was developed, Stein noted.

In contrast, when something is being developed in the manufacturing business, everyone usually knows what the product will be. In the com-

puter industry, where products require numerous amounts of creative input, the proprietary rights are vague.

The conflict arises when an employee decides he wants to leave his job for another or wants to go into business for himself. The product involved frequently was developed by the employee and he takes with him only his own knowledge and expertise.

"In these situations," Stein pointed out, "the court is faced with whether the product was developed at the employer's expense, including the employee's salary thus belonging to him or whether the employee has a right to use the knowledge and expertise he has developed in gainful employment in another job."

When a product is in fact unique and the employer keeps it secret by holding access to it under "lock and key" as well as requiring confidentiality from customers, the courts would be inclined to protect the employer or proprietary creator, Stein said.

If an employee left his job and took with him physical evidence, such as a tape file, the courts are likely to enjoin him from using the knowledge in another capacity.

"Frequently, cases turn on whether the secret product was derived from the skills of the employee or from the information supplied by the employer," Stein said.

Case Example

Stein offered as an example of employee rights the case of Amoco Products Co. vs. Lindley, which was decided in Oklahoma Supreme Court in 1980.

According to Stein, the court refused to enjoin the employee from using the knowledge of software he created for better accessing probability of oil-rich exploration fields because it determined that the product was his own knowledge.

Noting another consideration important in deciding cases of this kind, Stein said that if the employee merely wants to work at a different job, the court will usually be sympathetic. However, if the employee was an officer of the company, the courts are more critical because an officer is believed to be in a position more likely to take advantage of what he has learned as opposed to being the developer of a new product, Stein explained.

To avoid problems of this kind, Stein suggested that employers should:

- Establish physical security measures to guard product secrets.
- Draw up confidentiality agreements with employees enforceable during and after employment.
- Formulate written warnings on the secrecy of a product.
- Preserve secrets by customers and new contractees.

As for employees, Stein advised that they not take with them any physical evidence of product development upon leaving a firm. That makes it possible for the employee to argue that all of the knowledge was his own.

CODEX HIGH SPEED SPEED PRICES.

The new Codex LSI "E" Series modems start at just \$2650. And they're available for immediate delivery, backed by a full one year warranty.

Only Codex offers a family of three economy 9600 bps modems. And only Codex offers the choice of muxed and unmuxed versions. The LSI E9600, E9604 and the E96/V.29 all use state-of-the-art LSI technology and are built to the same exacting standards as our now-famous LSI modem line. This ensures the same unparalleled performance and reliability people expect from Codex.


As a standard feature, the LSI E9604 and the LSI E96/V.29 have integral four-channel buf-

fered multiplexers that allow several terminals to share a single voice-grade line, saving you further money on line costs. Also standard is full CCITT V.54 capability for complete local and remote testing. Plus, the LSI E96/V.29 meets strict international requirements for communication.

The Codex LSI "E" Series. Starting at \$2650, Codex makes first class travel a very affordable experience.

For any data communications problem, turn to Codex. The complete networking company. For more information, call 1-800-821-7700 ext. 897.

codex

 **MOTOROLA INC.**
Information Systems Group

Food Firm Gobbles Costs With Hand-Held Units

ANAHEIM, Calif. — Saddled by sluggish inventory counts, snack-food maker Laura Scudder's turned to a data entry system that produced a 50% savings in manpower costs and time.

Counting corn nuts is a nightly task at Scudder's, since the company's very existence depends on the freshness of its potato chips, pretzels and other snack foods. Next-day production schedules must revolve around stock on hand, company officials said. And that means a fast, accurate count of the 400-plus product lines is a real necessity.

Yet the inventory process has not always been as smooth as the firm's natural style peanut butter. According to data systems manager Don

Fingers, the nightly count often stretched long into the following afternoon before final counts could be reported.

"It took two workers using pencils and paper a full eight-hour shift just to count the products in the warehouse manually," Fingers recalled. "Their figures then had to be re-capped by hand and finally transferred onto optical scanner forms."

"By the time the information was fed through our computers and reported back in a meaningful way, we were often well into the next business day," according to Fingers.

Realizing that nothing tastes worse than stale cheese puffs, Fingers set out to speed up the inventory process. The answer, he knew, was in

bringing the computer power of his data processing center into the warehouse and eliminating as much human intervention as possible.

Hand-Held Terminals

His solution was hand-held terminals, a fairly recent innovation used primarily in direct order entry applications to collect data and feed it quickly to a mainframe for processing.

"We'd been using computers since 1968 for everything from payroll to distribution," he said. "It only made sense to extend the system to our nightly product counts."

The hand-held terminals — combined with a modem and receiver — seemed to provide the right method

for conducting inventories and getting the information into a usable form quickly, Fingers said.

He called in several terminal makers for demonstrations, finally selecting a unit from Azurdata, Inc. Azurdata then recommended Processing Innovations' Speech-Aided Modem (SAM) as the link between terminal and host computer.

Efficiency Improved

The results became quickly apparent. "It now takes one inventory worker only four hours to complete the count," Fingers said, "a 50% savings in manpower costs and time. Although no studies have been conducted, we assume that efficiency and accuracy have been dramatically improved by the total elimination of manual number crunching."

"And now, when we get to the office in the morning, completed inventory reports are waiting for us on our desks," he said.

After collecting his data each night, the firm's inventory taker connects the Azurdata terminal by acoustic coupler to a warehouse telephone.

The terminal then transmits the data — up to 1,000 pieces of information nightly — to SAM, which responds in a computerized "human" voice with a positive status message such as "Data OK. Thank you."

SAM then transmits the data to Scudder's Hewlett-Packard Co. HP 3000 Series 3 processor, which compiles the information into inventory reports.

'Human' Response

With any receiver other than SAM, the inventory taker would have had to listen for continuous or broken beeps — or in extreme cases, call the DP center a second time — to confirm that the data had been correctly received.

In a noisy warehouse environment, these beeps can easily be missed or not understood, a problem eliminated with SAM's "human" response. SAM's voice also eases the transition for workers unfamiliar with computers and high technology.

"Our decision to use SAM really was based on the strong recommendations of the terminal manufacturers," Fingers said. "In addition, other receivers simply couldn't handle the terminal we finally chose." (In addition to Azurdata, SAM supports Micronics International, Inc., MSI Data Corp., Norand Corp. and Telxon Corp. equipment. Software programmed into SAM's microprocessor adjusts for different parties automatically, so a combination of different terminals can be received simultaneously.)

"Of course, SAM's voice response was a bonus," Fingers said. "The equipment has been very well received, both in the DP center and in the warehouse."

Fingers chose a SAM model that includes a CRT terminal, a Zilog, Inc. Z80 CPU, 64K bytes of dynamic random-access memory, speech synthesizer, receiver software and self-test diagnostics. The CRT terminal version, priced at under \$5,000, can also act as a terminal for the host computer by displaying status information on its screen.

"MCBA Manufacturing System users get a fast payback on their investment."



"With MCBA's Manufacturing System installed, users can better manage their resources. They thank MCBA for giving them a fast payback on their investment."

"The MCBA Manufacturing System is designed for the business personality, making it easy for management to meet corporate goals. MCBA is one reason why HCC has a totally satisfied clientele."

Albert P. Castello and Richard I. Hoberman, Partners
The Hoberman Castello Company
Syosset, New York

MCBA

Mini-Computer Business Applications, Inc.
2441 Honolulu Avenue
Montrose, California 91020
Phone: (213) 957-2900 Telex: 194188

MCBA has long been known for low-cost, reliable mini-computer software packages. Now we bring you the MCBA Manufacturing System in DIBOL® for the DEC® PDP®-11s.

Computerize manufacturing environments with confidence. With MCBA's 17 integrated manufacturing and accounting packages. Fill out the coupon below and mail it today.

<input type="checkbox"/> Please send me more information on MCBA's Manufacturing System.	
<input type="checkbox"/> Please have a Sales Rep call me.	
<input type="checkbox"/> Basic Material Requirements Planning	<input type="checkbox"/> Standard Product Costing
<input type="checkbox"/> Bill of Materials Processor	<input type="checkbox"/> Accounts Payable
<input type="checkbox"/> Customer Order Processing	<input type="checkbox"/> Accounts Receivable
<input type="checkbox"/> Full Material Requirements Planning	<input type="checkbox"/> Fixed Assets and Depreciation
<input type="checkbox"/> Inventory Management	<input type="checkbox"/> General Ledger
<input type="checkbox"/> Labor Performance	<input type="checkbox"/> Job Costing
<input type="checkbox"/> Purchase Order and Receiving	<input type="checkbox"/> Payroll
<input type="checkbox"/> Shop Floor Control	<input type="checkbox"/> Report Writer
<input type="checkbox"/> Standard Product Routing	
Name _____	
Company _____ Title _____	
Address _____	
City _____ State _____ Zip _____	
Phone (____) _____	
I am an OEM <input type="checkbox"/> ; End User <input type="checkbox"/> ; Other <input type="checkbox"/>	

CW 91362

Off the Press

THE NEW ALCHEMISTS By Dirk Hanson

Perhaps because it's California, where at least one Mercedes lurks in every high-tech parking lot, the Silicon Valley attracts attention. This book details how the industry evolved, especially in Silicon Valley, but does so without the usual awe and wonderment. This is an interesting, sensible account from a serious writer and high-tech journalist. Hanson has researched well and has interviewed a number of people, such as Robert Noyce of Intel Corp. While allowing the reader to draw his own conclusions, there are interesting observations and quotes along the way. One person he spoke to confided he had learned the secret of the business: "The only thing you have to know about the electronics business is that nobody's driving the bus." A good read.

Hardcover, 364 pages, \$15.95, ISBN 0-316-34342-0. Little Brown and Co., 34 Beacon St., Boston, Mass. 02106.

THE ONE MINUTE MANAGER By Kenneth Blanchard, Ph.D., And Spencer Johnson, M.D.

These authors, in just 111 pages, present a lucid strategy for increasing productivity, morale and your own goals. Managers at IBM, Lockheed Missiles & Space Co., GTE and Chevron Oil Co. cite success using "one-minute" goals and techniques such as, "Help people reach their full potential: catch them doing something right" and "People who feel good about themselves produce good results." The publisher is so certain these management skills work that it offers a money-back guarantee.

Hardcover, 111 pages, \$15.00, ISBN 0-688-01429-1. William Morrow and Co., 105 Madison Ave., New York, N.Y. 10016.

DESIGN AND STRATEGY FOR CORPORATE INFORMATION SERVICES By Larry E. Long

This book presents a management information systems (MIS) long-range planning methodology designed to gather and disseminate information effectively throughout an organization. It covers all planning areas, including hardware, software, application systems, personnel, management, operations, facilities and more. It is an approach that integrates traditional DP operations with the tenets of corporate strategic planning and allows for expansion to other departments and functions when necessary. The author has integrated the planning experiences of many MIS professionals with his own experience to create a book of, by and for managers.

Hardcover, 186 pages, \$25.00, ISBN 0-13-201707-5. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

MANAGING THE SYSTEM LIFE CYCLE By Edward Yourdon

Yourdon's premise is that most projects tend to be over budget, behind schedule, unmanageable and ultimately of little or no use. He introduces a nine-stage software development methodology that allows managers to combine traditional

management techniques — to plan, organize, direct and control — with technical skills. The nine stages are survey, analysis, design, implementation, acceptance test generation, quality assurance, procedure description, data base conversion and installation. Yourdon stresses adapting the life cycle to your own organization, where appropriate, and using common sense at all times.

Paperback, 144 pages, \$27.00, ISBN 0-917072-26-X. Yourdon Press, 1133 Ave. of the Americas, New York, N.Y. 10036.

A GUIDE FOR SOFTWARE ENTREPRENEURS By A.L. Frank

The author contends that there are

many opportunities for industrious programmers to begin marketing their own software, but they often lack the basic business skills to succeed. This book concentrates on how to plan and market the software product, from characterizing entrepreneurial skills to business planning to sales and marketing. Several useful appendixes include venture capital, legal protection for software and how to offer seminars.

Hardcover, 190 pages, \$29.00, ISBN 0-13-370726-1. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

BRITTLE POWER

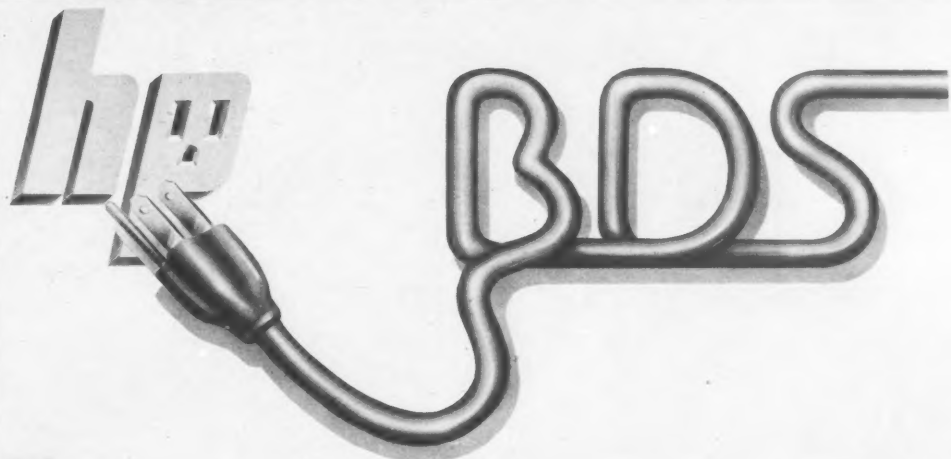
By Amory B. Lovins
And L. Hunter Lovins

America's energy system is brittle:

vulnerable and subject to sabotage, technical failures and natural disasters, and terrorists know it.

The husband-wife author team — he a physicist, she an attorney and social scientist — have diligently researched *Brittle Power*. They offer sensible solutions that will improve not only our energy problems, but will enhance national security as well.

Hardcover, 486 pages, \$17.95, ISBN 0-931790-28-X. Brick House Publishing Co., 34 Essex St., Andover, Mass. 01810.



BDS PRINTER SYSTEMS

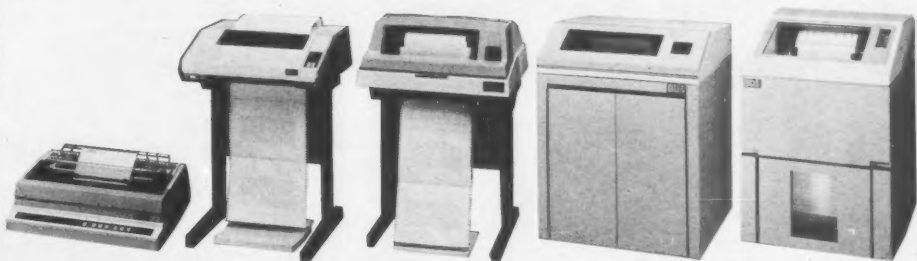
Plug
Compatible

Latest
Technology

Savings
30 to 50%

Nationwide
Service

Controllers and
Interfaces



HP Printer Model (1)	2601	2631B	2613	2608/2617	2619	HP-1500
BDS Replacement	LQ-40 40 cps Daisy Wheel	M200 200 lpm Matrix	B-300 300 lpm* Band	B-600 600 lpm* Band	B-1000 1000 lpm* Band	1200 lpm* Band

(1) 2613, 17, 19 interchangeable with 300-600 printer line

*Print speed with 64 character set

HP Computer Model	HP 1000/21 MX	HP 3000/III	HP 3000/30/33/44/64	Remote Spooled Printer (2631B)
BDS Controller	HPC-21	HPC-30	HPI-33	HPI-31



"It pays to have the
right connections."

BDS Corporation
1120 Crane Street
Menlo Park, CA 94025
(415) 326-2115
TWX 9103732005 (BDS MNPK)

BDS Computer (UK) Ltd.
125 Highgrove Street
Reading
RG1 5EN, England
(0734) 862183
Telex: 847423 (COCRG)

BDS Computer Australia Pty Ltd.
8th Floor, 445 Toorak Road
Toorak, Victoria 3142
(03) 241 8901
Telex: AA39067 (BDS AUS)

Scotland Yard to Battle Escalating Crime With

LONDON — Facing a sharply escalating crime rate, a dramatic surge in criminal violence and a generally growing "public order problem," police in Europe's largest city are preparing to strike back with their own array of technological weaponry.

By this time next year, citizens of Greater London dialing the familiar 999 police emergency number can expect a rapid response from the Metropolitan Police Force at Scotland Yard, thanks to a freshly installed computerized command and control system.

The system, according to Assistant Police Commissioner John S. Wilson, will put London's bobbies at the forefront of modern computing and communications technology. Addi-

tionally, the system, based around three Sperry Univac mainframes, will make it possible for police to handle the twofold increase in emergency calls projected for 1986, while the department reduces its communications work force by more than 20%.

As Wilson explained, the responsibilities of the Metropolitan Police have grown to prodigious proportions in its 153-year history. From its headquarters at Westminster Abbey and 120 local police stations, the force of 23,000 officers today patrols an area covering 787 square miles with over 7 million inhabitants. The existing communications system is simply inadequate to meet the growing needs of a modern police force,

Wilson noted.

When a Londoner dials the emergency number, he is connected to an operator at a police exchange, who then requests the type of emergency service required. If it is police service, the call is routed to Scotland Yard.

As presently configured, the information room is staffed by 24 operators handling 999 calls exclusively. Messages are scratched down on paper and then placed on a moving conveyor belt that travels to eight radio operators down the line. Ultimately the message is broadcast both to a prowler car and a local police station in the area of the emergency.

Wilson said the system works efficiently with the present volume of

3,000 calls per day, but that figure is expected to jump to 6,000 within four years.

"Instead of doing a patchwork job of adding more telephone and radio consoles," said Wilson, "we decided to take a complete look at the entire communications complex and see what the latest scientific and technological advances had to offer us."

Wilson said the department wanted to achieve a faster response to crime occurrences, even if it amounted to only a few seconds because it is a "known fact that most arrests are made immediately after the crime is committed." So off went Wilson and his staff to a number of European, Canadian and American cities to view different police communications systems, determined to cull the finer points of the various systems they viewed and integrate them into a supersystem for London.

System requirements were then designed and sent throughout the industry in 1978 on a competitive tender, with the proposals by Univac deemed the most appropriate to the needs of the department.

New Mode

Under the new mode of operation, the operator receiving the 999 call will key in the details of the message on a CRT terminal. As soon as the operator adds the phone number the caller is speaking from, whether it be from a pay phone or private home, the mainframe will immediately work out a map reference. As the mainframe can access all London area phone numbers, it will decide in an instant whether the number given by the caller is legitimate.

When the message is completed, the communicator will punch a key to transmit it to the appropriate radio operator at his CRT terminal. Meanwhile, the mainframe will have already sought out the police car nearest the emergency. And by punching map references, the map of the area will be displayed and will aid the operator in directing any needed back-up cars to the scene. Eventually all police vehicles will be equipped with a transmitter that will automati-

"We at DMW feel strongly about the immediate long distance cost reduction and service improvement opportunities which TOP can provide."



—Dr. Dixon R. Doll/President and CEO-The DMW Group, Inc.

Reduce your long distance costs...dramatically!

TOP™: Teletraffic Optimizer Program

A product that produces optimized voice network configurations by processing your actual call traffic data.

Data from the usage of WATS, FX, DDD, tie-lines, and other specialized carrier offerings is processed in combination with parameters such as tariffs, queuing options, ARS patterns and other control alternatives to design the lowest cost configuration which meets your required service levels.

TOP is available for lease on your in-house computer or, our network design consultants can perform an optimization for you. Since our fees for this turnkey service are based on the first 4 months savings, you have guarantee of a 4 month payback of your investment with DMW.

TOP Features/Benefits:

- Typical immediate savings have ranged from 5% to 25%
- The results are based on ACTUAL CALL DATA—therefore they reflect real savings
- You can simulate new configurations before any installation enabling selection of the best overall configuration.
- TOP can analyze and minimize the potential impact of pending tariff changes and restructuring.
- TOP is equipment independent—processes "SMDR-type" call data for all major PBX's and CENTREX in both single and tandem environments.

DMW also provides another product, TELECOST, which assists you in controlling, monitoring and allocating your telephone system expenditures.

Learn how you can dramatically reduce cost by reconfiguring your telecommunications network with DMW's proven products. Call Pat Koschalk or Mark Brown at 800-521-7802, or mail the coupon.

The DMW Group, Inc.

2020 Hogback Road
Ann Arbor, Michigan 48104
800/521-7802 313/971-5234

☐ Yes! I want to learn more about reducing my long distance costs dramatically. Please send pricing information, specifications and report samples on TOP.

☐ Also, please send information on TELECOST.

Name _____
Title _____
Company _____
Address _____
City/State/Zip _____
Phone _____



The DMW Group, Inc.
Telecommunications & Information Management Professionals

TELECOST and TOP are trademarks of The DMW Group, Incorporated, © 1982.

Pansophic Meet Slated Oct. 10-13

OAK BROOK, Ill. — Pansophic Systems, Inc. will hold its second national Pansophic Users Learning and Sharing Exchange (Pulse) conference on Oct. 10-13. The meeting will take place at the Amfac Hotel and Resort at the Dallas/Fort Worth airport in Texas.

Plans for the conference include 50 user presenters and panel members and 60 sessions that will include both user presentations and product discussions.

The keynote speaker will be Dr. James L. Tunney, president of the Institute for the Study of Motivation and Achievement and a National Football League referee for 21 years.

The registration fee for the conference is \$150. Details can be obtained by contacting Karen Taylor, National Pulse Coordinator, Pansophic Systems, Inc., 709 Enterprise Drive, Oak Brook, Ill. 60521.

Computerized Command and Control System

cally make the exact location of the cars known to the system.

The command and control system will be anchored by three Univac 1100/60 series CPUs, aided by the Univac V77-800 minis that will be the hub of the communications network, eventually to include 600 terminals.

Two 1100/61 systems, configured as a multiprocessor 1100/62 system, will be installed at Scotland Yard and the third at a communications center in North London. Each location will

have three V77-800s, while other minis will be installed at the police facilities in Hendon, connected to the North London 1100/61 system and used for training purposes.

Both machines in the 1100/62 configurations will normally be in operation, sharing the processing load. But if one should fail, the other will be able to carry on handling the full load. In the event of a catastrophic failure of the 1100/62, it will be possible to switch to the third 1100/61, which could provide restricted ser-

vice.

The 600 terminals in the network will be linked according to geographic location with the groups of V77-800 minis. The minis' function will be to act as communications concentrators to take some of the load off the 1100/61 mainframes. Only two of each group of three minis will be in day-to-day operation, leaving the third system as a back-up, according to Wilson.

The data communications network linking the minis to the mainframes

will operate at a speed of 9,600 bit/sec.

Once the system is fully up and running the department will have direct connections with the Police National Computer, which is maintained by the home office for the use of all the UK police forces. This link will give immediate access to central files on stolen suspect vehicles, persons arrested for serious offenses, persons wanted or sought by the police for various reasons and fingerprint records.

New KEYFAMILY small business computers for every size business.



M/A-COM Office Systems, Inc., formerly Ohio Scientific, designed the KEYFAMILY computer line for every size business.

But we didn't stop there. We made KEYFAMILY good for business. In more ways than one.

Good for business because you have the entire KEYFAMILY line to choose from—everything from personal computers to multi-user systems. Good for business because KEYFAMILY gives you proven price/performance leadership on all computers in the line. Good for business because most businesses grow, and KEYFAMILY small business computers grow with you instead of growing old. Good for business because all computers need occasional servicing, and there's a national KEYFAMILY dealer network at your beck and call. Good for business because M/A-COM, a Fortune 500 digital communications and information company, stands behind KEYFAMILY with its technological resources and financial stability. That's not only good for business, it's good for your confidence.

If you are thinking about buying a computer right now, why not get the line that's good for business. KEYFAMILY systems are now available through our national network of KEYFAMILY dealers. For the dealer nearest you, or for more information, write or call M/A-COM Office Systems, Inc., 7 Oak Park, Bedford, MA 01730; 1-800-C-A-L-L-O-S-I.

In Mass. call us at
(617)275-4440



Copyright 1982, M/A-COM Office Systems, Inc.

Meet the family at our road show and software fair

If you're an interested OEM systems integrator or value-added Independent Sales Organization, you're invited to join us at a special KEYFAMILY Road Show and Software Fair.

CITY	DATE
Minneapolis	15
Chicago	17
St. Louis	20
Houston	22
Atlanta	24
Orlando	27
Pittsburgh	29
Philadelphia	Oct. 1
New York	4
Boston	6
Toronto	8
Los Angeles	18
Seattle	20
Denver	22

As a leader in high-performance, multi-user information handling systems, we welcome the opportunity to explain the good-for-business benefits of working with the new OSI. At the show, we'll present and demonstrate innovative and cost-effective KEYFAMILY hardware as well as a variety of compatible new horizontal and vertical industry application packages.

For a reservation and the location and time in the city nearest you, dial 1-800-C.A.L.L.O.S.I. (In Massachusetts 617-275-4440.)

KEYFAMILY
Good for Business.

Credit Union Credits Growth to In-House System

OGDEN, Utah — More than \$1.5 million in savings has accrued in the Federal Employees Credit Union (Fecu) here over the last three years, thanks largely to the installation of an in-house computer.

The nation's 15th largest credit union grew by 15.5% in 1981 — its best year ever — and through the first half of 1982 was growing at a 27% annual rate, a spokesman said. A computer system that allows the organization to respond quickly to its fast-changing marketplace, while controlling operating costs, has been credited with a good portion of the credit union's success.

Quickness of response is the key to survival in the deregulated banking industry. Instead of just banks and savings and loans institutions, credit unions are now butting heads with Sears, Roebuck & Co., insurance and stock brokerage firms.

Trail of Liquidations

Reacting too slowly to industry changes has left a trail of liquidations and mergers within the credit union ranks. "It's a whole different world out there now," observed Rick Craig, the credit union's executive vice-president.

"To meet it we have to offer the same services, and we have to offer them quickly. Our DP system is the tool that will keep us competitive."

Traditionally, credit unions have opted to let service bureaus handle their DP needs. Financial data recorded on terminals by tellers was usually stored on a disk or tape and entered into the service bureau computer in batch at a later date. Credit unions paid banks or other financial institutions to provide other services such as share-draft processing.

Several years ago, a thorough cost analysis forced Fecu to reassess its DP environment. In 1979, the credit union purchased an on-line financial network built around IBM equipment.

In 1980, an IBM 4341 was installed at the operations center here. More than 130 IBM 3600 financial terminals located at 11 branch offices link tellers directly to the CPU.

Within the last year, three IBM 3614 automated teller machines (ATM) have been added to the system along with an IBM 3694 check processor that lets the credit union process its own share drafts.

"We have saved over \$1.5 million in the first three years the system has been in operation over what we

would have paid to the service bureau," Craig said. "And we have been able to offer a large number of services that we couldn't have offered without the computer system."

One new service made possible by the on-line system is the Security Fund, which competes against money market mutual funds and is federally insured. In its first year, the fund grew to nearly

\$46 million, with over half of that money representing new deposits for the credit union.

System software is the Comprehensive Credit Union System (Ccus), developed by Electronic Data Processing Corp. of Salt Lake City and marketed by IBM. Ccus incorporates all standard transaction types, account types, inquiry facilities and output reports used by

credit unions.

The on-line system features a response time of three to five seconds compared with the previous 30-second delay. "With the slow response time on the old system, the teller lines used to run out of the doors," recalled DP coordinator Linda Souhrada.

Having all financial data available in the on-line system means that credit union managers can keep a closer

rein on operations in order to control costs and increase profitability.

The systems software handles all standard credit union transactions, but credit union programmers can access the data files to create applications of their own. "Better quality control is now possible using the programs written by the DP staff," explained DP Manager Hugh Hadley.

If you don't feel this terminal supplier,

"They set the standard for the industry in service and quality."

"A very honest company to deal with... I can't think of a negative thing to say."

Steve Olla, Purchasing Manager
Millennium Systems Inc.



We don't satisfy our OEM customers by making the best promises. Instead, we make the best terminals for the money, and deliver them the way they want them — when they want them. A concept so simple, you'd think everyone would have caught on.

But apparently not. Our value, performance and service were so exceptional that when we entered the end-user market in 1979, we were able to become the No. 1 independent manufacturer of smart terminals in just two years. An accomplishment that prompted *Computer Systems News* to say "... TeleVideo is one of the most amazing success stories in the computer industry."

It doesn't amaze us, however. Once we found a way to beat the leaders on price and quality, finding customers was easy.

"We're quite pleased. We wanted a good reliable unit, and we're quite happy."

Tom Peters, Engineer
Gould Inc.



In fact, it was OEMs who first contacted us after our success in the general-purpose market, with the idea of modifying terminals. And now we're totally committed to the OEM market.

Here's what we can offer:

Uniqueness: We'll work closely with you all the way down the line to insure the right color, keyboard design, logo, and a code structure to interface with your software.

Fast delivery: We always have inventory ready for modification, so our turn-around on key operations begins the day you place your order.

Price/Performance: Nothing outperforms our terminals on the job, and no one beats our price for value. Our rigid testing and use of high quality components have made our record of customer service,

Accuracy, Timeliness Enhanced

Utility Saves With In-House Transfer Agent

JACKSON, Mich. — A projected annual costs savings of \$58,000 was just one reason why Consumers Power Co. here moved its transfer agent functions in-house.

Consumers Power Co. is an electric and gas utility that services the major portion of lower Michigan. It currently has 175,000 shareholders of common stock, and 45,000

shareholders of preferred and preference stock.

Prior to bringing its money transfer functions home, it was issuing 100,000 certificates per year between two outside agencies. Once it became sole transfer agent, it was able to consolidate many of the denominations of its certificates, and now it issues only 50,000 to 60,000 certi-

cates per year.

The change from an outside co-transfer agent to an in-house transfer agent was possible for Consumers Power because of the capabilities of the Corporate Shareholder System (CSS) software system from Informatics, Inc., which runs on the company's IBM 3030 computer system. According to Ronald D.

Childs, the assistant secretary and general transfer agent for the utility company, "We had the computer capability and staff to handle these functions and we were receiving a large number of complaints from our stockholders, brokers and banks."

Childs recalled that Consumers Power had originally licensed CSS in 1970, and af-

ter years of upgrades, the company decided to install the on-line capabilities needed to bring its dividend reinvestment function in-house. By utilizing the full range of features of the system, the company has been able to successfully coordinate all shareholders' options into one unit, thus improving service to shareholders.

Accuracy and timeliness of the reinvestment transactions have been greatly enhanced, according to Childs, and greater flexibility is now possible because up-to-date information is available on-line. Through consolidation, the power company has been able to create and control a high level of service to its shareholders, Childs said.

Greater Rapport

By dealing directly with stockholders, Consumers Power has also been able to establish a greater rapport with them and to improve morale, Childs claimed. Because of the 48-hour turnaround time required to get certificates issued and back to New York to meet New York Stock Exchange requirements, transfer work must be completed by 1 p.m. daily.

Although this time constraint results in a heavy work load, Childs reported that the staff realizes the importance of their work and pulls together as a unit. He also said the company did not have to increase its staff of 15 to bring these functions in-house, primarily because of the capabilities of CSS coupled with a positive staff morale.

Part of the success of the implementation was due to strong partnership feelings between Informatics, the CSS User Group and Consumers Power, in Childs' opinion. He found the exchange of information that takes place among members of the user group a valuable contribution to meeting his company's needs and invaluable for planning the support for future needs.

good about your call TeleVideo.

**"We've been using
TeleVideo terminals
since 1979.
They're very reliable,
reasonably priced,
and high in quality."**

Hollis Arban, President
Nabra Enterprises

**"TeleVideo is very
responsive to
our customizing needs.
They're high quality,
reliable units."**

John Spaulding, Project Manager
Gould Inc.



and satisfaction the best in the industry.

None of this efficiency is surprising when you know that our family of terminals are the only ones to use the same compatible, high quality components throughout the entire line. (Another simple concept that has given us a big advantage in assembling, customizing and servicing our units.)

All this means that our customers are very happy. If you're not, contact TeleVideo for more information. We want your business, and we can prove it.

For more information call 800-538-8725 (in California call (408) 745-7760) or your local TeleVideo sales office.

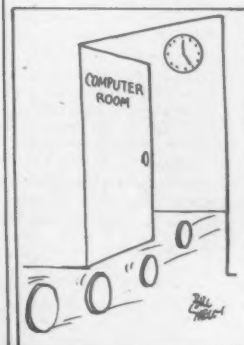
TeleVideo Systems, Inc.

TeleVideo Systems, Inc.
Dept. #208E
1170 Morse Ave.
Sunnyvale, CA 94086

Please send additional information on the TeleVideo OEM Program.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
PHONE # _____

CALIFORNIA Santa Ana 714/557-6095 Sunnyvale 408/745-7760 • GEORGIA Atlanta 404/255-9338 • TEXAS Dallas 214/980-9978 • ILLINOIS Chicago Area 312/351-9390 MASSACHUSETTS Boston 617/668-6891 • NEW YORK/NEW JERSEY 201/267-8805 UNITED KINGDOM West End Surrey 44-9905-6464



Nurses' Time Freed for Patient Care Hospital Slices Stockpiling Costs With System

DES MOINES, Iowa — Individual departments at Iowa Methodist Medical Center here no longer have to stockpile large amounts of medical supplies since the hospital installed a computer system dedicated to supplies management.

A number of years ago, it was determined that Iowa Methodist's supply system was inadequate, according to Gerald Burger, director of materials management. "Since the hospital's inception," he noted, "a completely manual operation had been in effect. Most of the functions involving the supply department were literally carried out with a pad and pencil."

For a while, materials management

tried to work with the already existing IBM computer that the DP department used to handle economic and patient care aspects of the hospital's operation. Ultimately, this alternative also proved unsatisfactory.

"In a hospital of this size, things like accounting, billing and patient history receive the most attention. In terms of computer time and availability, we just did not have a high priority," Burger observed. "It was generally agreed that we would have to come up with something else."

The possibilities were eventually narrowed to the following three alternatives: "We could try modifying the existing computer to meet our

needs; we could go to an outside vendor for some sort of time-sharing arrangement; or we could go to a mini-computer that might eventually interface with the mainframe." Ultimately, the hospital chose the third arrangement.

Burger and his assistant, Gary Janssen, supply distribution manager, formulated a list of requirements they considered essential. Included were such functions as inventory management, purchasing and fiscal reporting.

"We were immediately impressed with Wang [Laboratories, Inc.]," Janssen noted. "While the competition could only promise three or four

of the features we were interested in, Wang could provide 17 out of 20. We were also impressed with the flexibility of the machine. If the department decided to expand into different areas, the system could be expanded to meet these needs."

After visiting two similar Wang systems in Missouri and Illinois, the department chose Wang. The equipment was acquired in two installments. The first, delivered in August 1980, included a Wang 2200 Series MVP computer, an 80M-byte disk drive, five workstations, a daisy wheel printer and two matrix printers.

Satisfied with the initial system's performance, the department added one more 80M-byte disk drive, one 600 line/min band printer, two additional matrix printers and three workstations last November.

The Department of Materials Management is divided into five separate sections. The MVP assists workers in all five: warehousing, inventory control, central dispatch and customer service, purchasing and property management (maintenance).

The central dispatch and customer service section handles supply distribution in the main hospital. Formerly, each hospital unit was forced to stockpile large amounts of medical supplies.

Items like bandages, cotton, solutions and syringes were all stored in traditional supply areas and were the responsibility of a ward's nurses. In effect, these nurses were forced to devote a portion of their work day to the rudiments of supply.

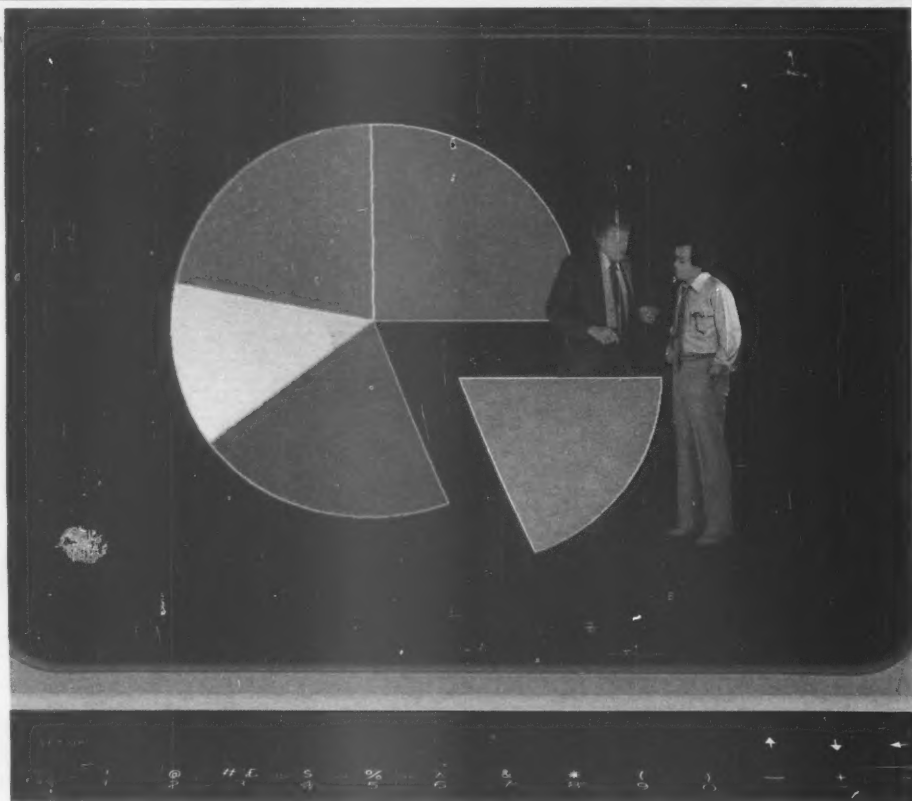
Freeing Nurses' Time

The Wang 2200 system eliminated this process. "Each day a metal cart, designated for a particular floor, is stocked in the central supply area. The carts are then manually transported to their assigned positions," Janssen explained.

"Throughout the course of the day, nurses can remove supplies," he continued. "Articles like solutions, which must be billed individually to the patient, are tagged with a computerized sticker. A nurse removes the number, enters it into a cardex file and keeps track of consumption on a daily basis. At the end of a 24-hour period, each cart is transported back to the central supply area, where a clerk checks off depleted items on a standardized form and restocks the vehicle," he said.

The new Wang system saves a considerable amount of time. Nurses are now relieved from the supply function, which allows time for actual patient care. Supply orders and price changes are now handled on an immediate basis.

"The process frees revenue that ordinarily would be tied up for months. In a warehouse that contains approximately \$600,000 worth of supplies, the computer has allowed us to cut back or eliminate \$200,000 allotted to needless or overstocked materials. Much of this money was diverted toward the purchase of expensive operating room equipment that was formerly unobtainable," Janssen noted.



Color and graphics put management in the picture.

For the best user comprehension, nothing beats color and color graphics. The high performance/low cost ID Systems Business Color Graphics Terminal does this by producing eight brilliant colors for dazzling color graphics.

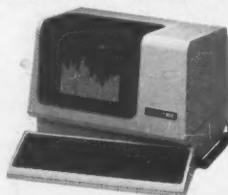
The ID-100 family of Business Color Graphics Terminals are full-featured color alphanumeric terminals compatible with most existing computer systems because they are VT100®-based terminals. They are also color graphics terminals, fully compatible with some of the most powerful business graphics software packages currently available, e.g. DISPLA®/TELL-A-GRAF® from

ISSCO®, and the general purpose graphics software package PLOT10® from Tektronix 4010®.

If you do not have existing business graphic software, the ID-100 is a help here also. The terminal is programmed (firmware) to perform complex graphic tasks using simple commands. We call it POWER-graph. You can create your own color graphic displays using your existing application software if you wish. POWER-graph gives you full vector and cursor control, circle/arc generation and color fills. Under POWER-graph, ID Systems' Virtual Image Management System allows you to window an image, select

different origins and scale its size to create multiple displays.

The ID Systems Corporation's ID-100 VA Business Color Graphics Terminal provides you with a screen resolution of 512 x 256 (240 visible). Other products from ID Systems include high resolution color/monochrome graphic terminals, monochrome GraFIX kits for VT100's® and factory upgrading of your VT100® to color graphics—all at very competitive prices. Call, write or TWX for our low prices and more information.



ID ID Systems Corporation

4093 Leap Road, Hilliard, Ohio 43026
614/876-1595 TWX: 810-482-1049

● VT100 is a registered trademark of Digital Equipment Corporation.
● PLOT10 is a Tektronix trademark.
● TELL-A-GRAF, DISPLA and ISSCO are trademarks of Integrated Software Systems Corporation.

ESPRIT III™

goes TVI-950 one better.

The new Hazeltine Esprit III™ is a plug-to-plug replacement for the TeleVideo TVI-950. Same command set. Same keyboard layout. The same features. Even the same user-PROM capability.

But Esprit III goes TVI-950 one better. And that one important difference is price. Esprit III costs \$300 less. In fact, it costs \$100 less than TeleVideo's far less capable TVI-925.

Look at the numbers. TVI-950 performance for less than TVI-925 cost. You'll agree. Esprit III is the best one.

	Esprit III	TVI 925*	TVI 950*
Buffered mode	Yes	Yes	Yes
Programmable function keys	Yes	No	Yes
Line graphics	Yes	No	Yes
Page/line transmit	Yes	Yes	Yes
Smooth scrolling	Yes	No	Yes
Price	\$895	\$995	\$1,195

*Trademarks of TeleVideo Systems, Inc.

Hazeltine Corporation, Computer Terminal Equipment, Commack, NY 11725 (516) 462-5598 or call toll free: 800-645-4508

Hazeltine

The new terminal technology.



Firm Finds Pooling Credit, MIS Brings Benefits

NEW HYDE PARK, N.Y. — The credit and management information systems (MIS) departments of the Julius Wile Sons & Co. division of Nabisco Brands, U.S.A. here decided to pool efforts to develop a computerized solution for credit and accounts receivable needs. The resulting system has brought benefits in both areas.

Don Perri, director of credit at Julius Wile, said that the system has helped his group realize a seven-day turnaround gain in monthly closings, as well as reductions in both charge-backs and day sales outstanding. The firm's MIS director, Don Krauer, cited the absolute control provided by the system audit trail and central information file and the

improved data integrity through real-time file updates as the biggest rewards from his perspective.

"Two-and-a-half years ago, Julius Wile was growing into a large organization and there was a desperate need to update all the MIS systems," Perri explained. "I was given the option to look at an on-line system for our credit department, so I created a list of tasks I thought such a system should perform."

Perri and corporate MIS representatives subsequently met, and Krauer was assigned to design an on-line credit and accounts receivable management system for Perri's department.

Recognizing the advantages of using packaged solutions over in-house

development systems, Krauer invited Perri to visit user sites of various software packages. Together they agreed that the Fortex Credit and Accounts Receivable Management System (Carms), marketed by University Computing Co. (UCC), best met their needs.

"The final step was to ensure that we were not going to purchase a package which was incompatible with the requirements of corporate and its other divisions," Krauer said. "Once this hurdle was overcome, a contract was signed with discounts for multiple data sites." Since then, five other Nabisco Brands corporate divisions have installed Carms.

Julius Wile's data center runs an IBM 3031 with CICS using Vsam. Its

Imports Division, which was representative of the company's beverage business as a whole, became the first of five divisions to undergo conversion to Carms.

Phase 1 of the implementation called for accounting, MIS, credit and accounts receivable management teams to attend off-site vendor seminars to learn the theory of Carms. During Phase 2, credit and accounts receivable managers and their staffs attended two days of in-house training conducted by a UCC Fortex representative.

"We found Carms not only very logical and easy to install, but also very adaptable to what we were doing," Perri explained. Initially, Carms and the firm's batch system were run in tandem for close to six weeks. "Actual data conversion was our biggest concern, but in the end, we balanced both systems out to the penny; nothing was lost," he said. "Under the old batch system, we had trouble getting the final receivable numbers," Perri said. "This meant we would do our closings anywhere between the seventh and the 10th of the month and couldn't begin to crack down on receivables until close to the 15th. During the first month with Carms, we closed on the third working day and gained seven days in which to recover receivables and improve cash flow," he noted.

The information provided by the new system also has armed Perri's staff with additional information during their collection calls.

"We know the saying about the squeaky wheel getting the oil is true, because now with our system we can be a squeaky wheel which collects its accounts on time," he said.

NEW FROM MICRO-TERM A 66 LINE WORD PROCESSING TERMINAL FOR ONLY \$1695



At last, the ERGO 4000 -- the full-page word processing terminal you've been waiting for. At the price you've been waiting for -- \$1695 (with quantity discounts available). ERGO 4000 is a 66-line by 80-character terminal, compatible with VT-100 codes as well as other popular code structures.

The newest member of the ERGO Series, the ERGO 4000 gives you complete performance for the price. The tiltable cabinet with crisp green display for increased comfort and productivity, and the many additional ergonomic features, are all standard with the ERGO 4000.

The ERGO 4000 offers the following additional features:

- ☐ Four video attributes ☐ Pass through printer port
- ☐ Savable set up mode ☐ Screen saver
- ☐ Fifteen function keys ☐ Diagonal cursor movement
- ☐ Alternate character generator ☐ Transparency mode
- ☐ Settable tabs

ON SITE SERVICE IS AVAILABLE IN OVER 450 CITIES THROUGH WESTERN UNION

MICRO-TERM, INC.

1314 HANLEY INDUSTRIAL COURT,
ST. LOUIS, MISSOURI 63144,
(314) 968-8151 TWX 9107601662,
MICROTERM STL

*VT-100 is a registered trade mark of Digital Equipment Corporation.

ERGO 4000

MICRO-TERM. Terminals are our only product, and we put more into them.

Communications & Networking

TSX-NET™

for LSI & PDP-11's running
RT, TSX & TSX-PLUS

In use in over 100 installations in 10 countries, in Fortune 500 Companies, DEC OEMs, Software Houses, Major Laboratories, Universities & Aerospace firms.

- ★ Provides full transparent access to peripherals on remote systems via user programs or standard system utilities—Not just a file transfer utility
- ★ Uses standard serial or multiplexed lines on LSI or PDP equipment
- ★ Lowers hardware costs by sharing peripherals
- ★ Facilitates OEM support to remote users
- ★ LOW COST
- ★ Permits on RT-11 or TSX-Plus system to transfer ASCII files to or from RSX, VAX, or non-DEC systems

CALL OR WRITE FOR MORE INFORMATION

GABA™

Glenn A. Barber & Associates, Inc.
15010 Ventura Blvd., Suite 304
Sherman Oaks, CA 91403
(213) 907-6622

DEC, RSX, VAX, RT-11, LSI-11 & PDP-11 are registered trademarks of Digital Equipment Corp. TSX and TSX-Plus are registered trademarks of S & H Computer Systems, Inc.

Data Center Enhancements Focus of Sept. 20 Course

AVON, Conn. — A four-day course designed to provide participants with practical methods to enhance the effectiveness, productivity and efficiency in the operation of their data centers will be presented by Computer Systems Research, Inc. Sept. 20-23, in Hartford, Conn.

The course is geared toward the needs of data center and technical managers, supervisors, operations personnel, planning staffs and users who are interested in the overall management of a data center.

The course will be divided into four segments emphasizing data center organization and functional responsibilities, personnel resource management, data center planning and objectives and the management of

change and quality performance.

Particular emphasis will be placed upon providing participants with practical management concepts on organizing, planning, measuring and reporting systems and methods for managing the critical resources of the data center, the release said.

Participants are requested to bring data center or company organizational charts, blank job descriptions, performance reviews or performance logs used by their company.

Tuition for the four-day course is \$600. Further information is available from Computer Systems Research, 40 Darling Drive, Avon Park S., Avon, Conn. 06001.

Oxford to Host User Group Meet Starting Oct. 7

ATLANTIC CITY, N.J. — Oxford Software Corp. will host its annual international user group conference Oct. 7-8 here at Harrah's Marina Hotel Casino. The theme of the two-day conference is "Securing the Fourth Generation."

Various topics of interest will be covered by working committees and in general session. In addition, new product information will be unveiled, according to Linda Baliman, program chairman.

The keynote address will be given by Richard Murch of the Technology Transfer Institute, who will speak on "Application Development Without Programmers." Featured as the second keynote speaker will be Alan Brill, director of professional services for Yourdon, Inc., who will speak on "Identifying Security Needs of Computer System Developers."

The registration fee for the conference is \$300. Further information is available from Oxford Software Corp., 174 Boulevard, Hasbrouck Heights, N.J. 07604.

Codasyl Users Get Journal

OTTAWA — The Codasyl End User Facilities Committee has published its initial "Journal of Development," which is the committee's current version of specifications for an end-user facility.

The purpose of the journal is to open communications between the committee and members of the public interested in end-user facilities, according to a release.

The journal is available from the Canadian government for the equivalent of \$10 in Canadian currency. All responses to the journal or comments on end-user facilities should be forwarded to Chairman, Codasyl EUPC, Box 1808, Washington, D.C. 20013. The publication may be ordered by writing to the Canadian Government Publishing Centre, Supply and Services Canada, Ottawa, Ontario, Canada K1A0S9.



"Normalized Data Structures are the proper foundation for all information systems."

— James Martin/Chairman of the Board-Database Design, Inc.

FREE SEMINAR:

Database Design, Inc. (DDI) is presenting a series of free half-day seminars on DATA DESIGNER, a tool developed in conjunction with James Martin to aid in the design of Stable Logical/Normalized Data Structures.

Who Should Attend:

- ◆ Data Administrators
- ◆ Data Analysts
- ◆ Data Base Administrators
- ◆ Data Base Designers
- ◆ DP Executives

Dates & Locations:

Western Region:

October 20	Sunnyvale, CA
October 21	San Francisco, CA
October 27	Los Angeles, CA
October 29	Newport Beach, CA
November 3	Phoenix, AZ
November 16	Vancouver, BC
November 17	Seattle, WA
November 19	Los Angeles, CA
December 3	San Francisco, CA

Central Region:

October 12	Toronto, ON
October 19	Chicago, IL
October 21	St. Louis, MO
October 26	Houston, TX
October 28	Dallas, TX
November 3	Denver, CO
November 5	Minneapolis, MN

Eastern Region:

October 18	Stamford, CT
October 18	Washington, DC
October 19	New York, NY
October 19	Arlington, VA
October 20	Baltimore, MD
October 21	Saddlebrook, NJ
October 21	Philadelphia, PA
October 26	Bedford, MA
October 27	Boston, MA
November 2	Hartford, CT
November 3	Rochester, NY

Subject to change. Confirmation with acknowledgment.

- ◆ Learn what Normalization of Data Structures is and how easy of a concept it is to understand.
 - ◆ Learn why it is very important to you, your position, your productivity.
 - ◆ Learn how you can do it quickly and easily.
- ...If you have DATA DESIGNER. But, it can be done without it. Attend the Seminar and find out how.

DATA DESIGNER™

DATA DESIGNER recently won the One Million Dollar Award and is the first DDI product in a full range of Information Engineering products.

How to Register:

Register now. Registration is limited. So please register at your earliest possible opportunity by contacting DDI Seminar Services, at:

1-800-521-7802

When registering, please state: "Data Designer Seminar", and its City and Date with your Full Name, Company Title, etc. Thank you. An acknowledgment and additional information will be mailed to you.



Database Design, Inc.
2020 Hogback Road
Ann Arbor MI 48104
313/971-5363

James Martin is founder and Chairman of the Board of Database Design, Inc. DDI provides Consulting Services, Educational Programs and Software products in the Information Engineering and Management fields in support of Mr. Martin's methodologies.

IF YOU'VE GOT . . . CICS WE'VE GOT YOUR . . . COURSES

CICS/vs Concepts and Facilities	Sept. 15 Nov. 05
CICS/Command Level Programming	Sept. 20-24 Nov. 15-19
CICS/vs Application Design	Oct. 18-21 Dec. 14-17
CICS/vs Command Level Debugging	Oct. 12-13 Dec. 09-10
CICS/vs Recovery/Restart	Oct. 04-06 Dec. 01-03
CICS/vs System Problem Debugging	Nov. 08-09
CICS/vs Audit and Controls	Dec. 06-08
VSAM Structure and Programming	Nov. 01-04

TELTECH has got them all . . . Public
in NEW YORK CITY . . . this fall



For Registration & Information, Call:

TELTECH at (212) 921-0250
548 Fifth Avenue, New York, N.Y. 10036

Trying To Make Your Dinosaur Work Miracles?

Forget about leaping tall buildings in a single bound. With obsolete financial software, just satisfying routine business needs is a feat in itself.

A clever disguise won't help provide timely information for critical management decisions. Or meet new requirements quickly and inexpensively. Not even a miracle can transform mild-mannered, batch software into a results-oriented, real time system.

That's why you need a fresh start.

Walker's Integrated, Interactive Financial Systems (II/FS) give you real time information for real time decisions. Real time means more accurate data, quicker closings, and better control. Variances from plan are available at decision time, rather than a month after. Real time systems finally make financial data a driving force in management decision making.

II/FS combines real time processing with real time personalization. From a terminal, you can tailor application processing to your unique requirements, giving your large scale system the flexibility, friendliness, and responsiveness of personal computing.

And forget about duplicated effort. Enter data one time, in one system, and it's balanced in all systems. Because II/FS is a fully integrated family, featuring:

- Accounts Payable
- Accounts Receivable and Credit
- Purchase Order
- Material Management
- General Ledger

II/FS means long term strategic solutions. Our unique "Software Bridge" isolates applications from the technology environment. The Bridge facilitates sophisticated TP and DBMS usage with today's latest technology. It's your insurance for easy migration to future technology.



Check These Differences

II/FS FOR TODAY'S RESULTS

- INTERACTIVE PROCESSING immediately screens data for accuracy at the source and ensures timeliness.
- REAL TIME TRANSACTIONS work the way your business works—a natural complement.
- INTEGRATED SYSTEMS provide balanced data with single entries.
- REAL TIME QUERY displays up-to-the-second information.
- PERSONALIZED SYSTEMS address your ongoing needs, precisely, quickly, and inexpensively.

THE DINOSAUR APPROACH

- BATCH solves today's problems tomorrow.
- ONLINE DATA ENTRY turns accountants into keypunchers.
- SEPARATE SYSTEMS duplicate work and increase out-of-balance risks.
- ONLINE QUERY highlights yesterday's reports on a CRT.
- STANDARD, INFLEXIBLE SYSTEMS require continual, costly reprogramming.

WALKER

WALKER INTERACTIVE PRODUCTS, 100 MISSION ST., SAN FRANCISCO, CA 94105 (415) 495-8811

FINANCIAL SOFTWARE SEMINARS

Don't waste time reviewing outdated and rigid systems. Only WALKER offers a full line of interactive financial solutions for mainframes.

- | | |
|--------------------------|-----------------------------|
| Atlanta, GA - Oct. 6 | Kansas City, MO - Oct. 21 |
| Boston, MA - Oct. 7 | Los Angeles, CA - Sept. 16 |
| Calgary, AL - Sept. 7 | Miami, FL - Oct. 19 |
| Charlotte, NC - Oct. 5 | Minneapolis, MN - Oct. 20 |
| Chicago, IL - | Montreal, QUE - Sept. 8 |
| Downtown - Oct. 13 | New York, NY - Sept. 16 |
| Airport - Sept. 14 | Philadelphia, PA - Sept. 15 |
| Cincinnati, OH - Oct. 19 | San Francisco, CA - Oct. 15 |
| Cleveland, OH - Sept. 14 | San Jose, CA - Sept. 9 |
| Costa Mesa, CA - Oct. 21 | Seattle, WA - Sept. 8 |
| Dallas, TX - Sept. 15 | Secaucus, NJ - Oct. 6 |
| Denver, CO - Oct. 14 | St. Louis, MO - Sept. 9 |
| Detroit, MI - Oct. 5 | Toronto, ONT - Oct. 12 |
| Houston, TX - Oct. 20 | Washington, D.C. - Oct. 7 |

Please Send ☐ More Information ☐ Seminar Registration

CW 5

Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

WALKER INTERACTIVE PRODUCTS,
100 MISSION ST., SAN FRANCISCO, CA 94105 (415) 495-8811

Metal Parts Reps Obtain Quotes With T/S System While On-Site

HOLLAND, Mich. — A manufacturer of custom metal parts here is using a computerized quoting system which enables sales representatives to provide accurate pricing information without leaving the customer site.

The Trans-Matic Manufacturing Co. uses a time-sharing system designed by Hewlett-Packard Co. to calculate prices based on specifications provided by the customer. A sales representative arrives at a customer location carrying a portable terminal with a built-in modem. He dials into the system located in Holland and enters the customer name, division, address and contact.

He then enters part names, numbers, thicknesses and material type, such as steel or brass, to describe the blank shape from which the part will be formed. The computer then asks questions based on that input. The representative types in standard codes to specify the work to be performed on the blank.

The computer calculates labor and material costs for the entire press process. It also includes quality control costs such as gauges and inspection time.

The base price in hand, the sales representative can then add other customer specifications, such as plating materials to be used, preparation and shipping schedules. The computer automatically figures shipping costs into the cost of the part. Finally, a sales commission is added, based on a formula built into the software.

"We do nearly 1,200 quotes each year," said Bill Stumpf, Trans-Matic vice-president. "I'd need at least two more people to handle that load if we didn't have this system."

Stumpf added that the computerized system lends credibility to Trans-Matic because it allows the customer to follow the quote step-by-step and because it ensures accuracy.

Even if the customer does not place an order, the quote is added to a master list.

CAM-I Conference Slated for Oct. 26-28

RENO, Nev. — Computer-Aided Manufacturing International, Inc.'s (CAM-I) 11th Annual Meeting and Fall Technical Conference will address the theme of "Beyond CAD/CAM — Extending the Limits." The conference will be held here Oct. 26-28.

General technical presentations beginning on Wednesday will cover applications in such areas as mechanical design, electronic design interfacing, facilities planning, numerical control and architectural engineering. Panel discussions will cover "Getting Started in CAD/CAM" and "How to Maintain Momentum in CAD/CAM."

The registration fee is \$270 for CAM-I members and \$370 for non-members. More information is available from Rhonda Gerganess, CAM-I Conferences, Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.

Increase your ability to meet tomorrow's challenges

Datapro Seminars 1982

September through
December

44 seminars including 5 technology seminars for architects and engineers designed and produced by Datapro and Sweet's and 4 management science seminars for the information processing professional

Data Communications: An Introduction to Concepts and Systems

SEPT.	13-15	NEW YORK
SEPT.	20-22	CHICAGO
SEPT.	20-22	DENVER
OCT.	13-15	SAN FRANCISCO
OCT.	13-15	WASHINGTON
OCT.	20-22	NEW YORK
NOV.	3-5	BOSTON
NOV.	17-19	HOUSTON
NOV.	17-19	LOS ANGELES
DEC.	1-3	NEW YORK
DEC.	13-15	SAN FRANCISCO
DEC.	15-17	ATLANTA
DEC.	15-17	WASHINGTON

Data Communications: Advanced Concepts and Network Management

SEPT.	16-17	NEW YORK
SEPT.	23-24	SAN FRANCISCO
OCT.	7-8	WASHINGTON
OCT.	21-22	CHICAGO
OCT.	28-29	DENVER
NOV.	22-23	BOSTON
DEC.	9-10	LOS ANGELES
DEC.	13-14	NEW YORK
DEC.	16-17	DALLAS

Data Communications: Effective Network Design

SEPT.	29-OCT. 1	NEW YORK
OCT.	25-27	CHICAGO
NOV.	15-17	WASHINGTON
NOV.	29-DEC. 1	SAN FRANCISCO

Teleprocessing Software: An Introduction to Concepts, Systems and Applications

SEPT.	27-29	WASHINGTON
OCT.	4-6	NEW YORK
NOV.	1-3	SAN FRANCISCO

Distributed Systems: Effective Approaches and Applications

OCT.	25-27	NEW YORK
NOV.	3-5	CHICAGO
NOV.	17-19	SAN FRANCISCO
DEC.	13-15	WASHINGTON

IBM's Systems Network Architecture: A Master Plan for Teleprocessing

SEPT.	13-14	WASHINGTON
SEPT.	23-24	CHICAGO
SEPT.	30-OCT. 1	NEW YORK
NOV.	4-5	SAN FRANCISCO
NOV.	22-23	HOUSTON
DEC.	13-14	NEW YORK

Telecommunications Management: Cost Reduction Techniques

SEPT.	20-22	CHICAGO
SEPT.	29-OCT. 1	NEW YORK
OCT.	27-29	SAN FRANCISCO
NOV.	29-DEC. 1	WASHINGTON

Local Area Networks: Selection Guidelines

SEPT.	20-21	SAN FRANCISCO
OCT.	4-5	CHICAGO
OCT.	14-15	BOSTON
OCT.	25-26	WASHINGTON
NOV.	11-12	LOS ANGELES
NOV.	18-19	NEW YORK

Networking, Protocols and Standards

SEPT.	30-OCT. 1	LOS ANGELES
OCT.	18-19	NEW YORK
NOV.	1-2	BOSTON
NOV.	4-5	CHICAGO
NOV.	11-12	WASHINGTON
NOV.	15-16	SAN FRANCISCO
NOV.	22-23	DENVER
DEC.	13-14	HOUSTON
DEC.	16-17	NEW YORK

Information Systems Planning: A Structured Approach

SEPT.	20-22	NEW YORK
SEPT.	29-OCT. 1	SAN FRANCISCO
OCT.	25-27	CHICAGO
NOV.	29-DEC. 1	WASHINGTON

Systems Analysis and Design: Concepts and Effective Practice

SEPT.	13-15	NEW YORK
SEPT.	20-22	SAN FRANCISCO
OCT.	4-6	CHICAGO
OCT.	18-20	BOSTON
NOV.	3-5	WASHINGTON
DEC.	6-8	LOS ANGELES

Structured Systems: Analysis, Design and Programming

SEPT.	20-22	CHICAGO
OCT.	4-6	LOS ANGELES
NOV.	3-5	NEW YORK
DEC.	6-8	WASHINGTON
DEC.	13-15	SAN FRANCISCO

Computer Software Packages: Evaluation and Selection

SEPT.	15-17	WASHINGTON
SEPT.	29-OCT. 1	DALLAS
OCT.	13-15	CHICAGO
NOV.	10-12	NEW YORK
DEC.	13-15	SAN FRANCISCO

Structured Testing: Tools and Techniques

SEPT.	13-15	SAN FRANCISCO
SEPT.	22-24	WASHINGTON
OCT.	18-20	LOS ANGELES
NOV.	15-17	CHICAGO
DEC.	6-8	NEW YORK

Data Base Management Systems: Concepts and Guidelines

SEPT.	13-15	BOSTON
SEPT.	20-22	SAN FRANCISCO
SEPT.	29-OCT. 1	CHICAGO
OCT.	25-27	NEW YORK
NOV.	15-17	DENVER
DEC.	8-10	WASHINGTON

Data Base Management Systems: A Comparative Analysis of General Purpose Systems

SEPT.	13-15	ATLANTA
OCT.	4-6	WASHINGTON
OCT.	18-20	SAN FRANCISCO
NOV.	8-10	CHICAGO
NOV.	29-DEC. 1	NEW YORK
DEC.	13-15	LOS ANGELES

Data Administration: Successful Techniques

OCT.	18-19	NEW YORK
OCT.	28-29	DALLAS
NOV.	22-23	CHICAGO
DEC.	6-7	WASHINGTON
DEC.	13-14	SAN FRANCISCO

Data Security: Implementation and Management

OCT.	27-29	SAN FRANCISCO
SEPT.	15-17	NEW YORK
OCT.	20-22	HOUSTON
NOV.	10-12	CHICAGO
DEC.	6-8	WASHINGTON

Structured Maintenance: Reducing Costs with a New Methodology

SEPT.	20-21	LOS ANGELES
OCT.	4-5	NEW YORK
NOV.	18-19	SAN FRANCISCO
NOV.	29-30	CHICAGO
DEC.	13-14	WASHINGTON

EDP Operations Today: Effective Scheduling and Console Operation

SEPT.	13-15	NEW YORK
OCT.	18-20	CHICAGO
OCT.	25-27	BOSTON
NOV.	15-17	WASHINGTON
DEC.	8-10	SAN FRANCISCO

Computer Operations Management: Effective Techniques

SEPT.	22-24	CHICAGO
OCT.	18-20	SAN FRANCISCO
OCT.	25-27	NEW YORK
NOV.	15-17	DENVER
DEC.	13-15	WASHINGTON

Computer Performance Measurement and Capacity Planning: Tools and Techniques

OCT.	13-15	WASHINGTON
NOV.	8-10	LOS ANGELES
NOV.	15-17	NEW YORK
DEC.	1-3	CHICAGO
DEC.	6-8	SAN FRANCISCO

EDP Project Management: A Practical Approach

SEPT.	13-15	WASHINGTON
OCT.	20-22	SAN FRANCISCO
NOV.	8-10	CHICAGO
NOV.	29-DEC. 1	DENVER
DEC.	13-15	NEW YORK

Advanced EDP Management: Methods and Techniques in the 80's

SEPT.	20-22	NEW YORK
OCT.	4-6	SAN FRANCISCO
OCT.	25-27	DALLAS
NOV.	10-12	WASHINGTON
DEC.	1-3	CHICAGO

Office Automation: Concepts, Systems and Applications

SEPT.	22-24	NEW YORK
OCT.	13-15	SAN FRANCISCO
NOV.	3-5	CHICAGO
DEC.	8-10	WASHINGTON
DEC.	15-17	LOS ANGELES

Office Automation: Strategic Planning Techniques

NOV.	17-19	SAN FRANCISCO
SEPT.	20-22	WASHINGTON
OCT.	18-20	LOS ANGELES
NOV.	29-DEC. 1	CHICAGO
DEC.	13-15	NEW YORK

Integrating Office Automation and EDP Systems: Effective Strategies

OCT.	6-8	NEW YORK
NOV.	3-5	CHICAGO
DEC.	6-8	WASHINGTON
DEC.	15-17	SAN FRANCISCO

Improving Office Productivity: Principles and Practices

SEPT.	29-OCT. 1	CHICAGO
OCT.	4-6	HOUSTON
OCT.	25-27	WASHINGTON
NOV.	15-17	NEW YORK
NOV.	29-DEC. 1	SAN FRANCISCO

Word Processing Systems: Planning, Design and Operation

SEPT.	13-15	SAN FRANCISCO
SEPT.	22-24	DALLAS
OCT.	6-8	WASHINGTON
OCT.	18-20	CHICAGO
NOV.	3-5	NEW YORK

Data Processing: Fundamental Concepts

SEPT.	20-22	WASHINGTON
OCT.	4-6	SAN FRANCISCO
OCT.	18-20	CHICAGO
NOV.	8-10	HOUSTON
NOV.	29-DEC. 1	LOS ANGELES
DEC.	6-8	NEW YORK

Minicomputer Systems: Guidelines for Successful Selection, Acquisition and Operation

SEPT.	13-15	WASHINGTON
OCT.	13-15	CHICAGO
NOV.	15-17	SAN FRANCISCO
DEC.	15-17	NEW YORK

BASIC: An Introduction to Computer Programming for Managers

SEPT.	20-22	SAN FRANCISCO
OCT.	6-8	BOSTON
NOV.	10-12	NEW YORK
DEC.	1-3	CHICAGO

Using Computer Graphics: Techniques, Systems and Applications

SEPT.	20-22	CHICAGO
OCT.	25-27	NEW YORK
NOV.	10-12	WASHINGTON
DEC.	6-8	LOS ANGELES

Microcomputer Systems: A Guide to Selection and Application

SEPT.	20-22	NEW YORK
OCT.	13-15	SAN FRANCISCO
NOV.	15-17	WASHINGTON
DEC.	15-17	CHICAGO

Using CAD/CAM Systems: Planning, Equipment Selection and Applications

SEPT.	13-14	SAN FRANCISCO
SEPT.	30-OCT. 1	NEW YORK
OCT.	25-26	DALLAS
NOV.	29-30	WASHINGTON
DEC.	13-14	CHICAGO

Managing and Motivating Information Processing Professionals

OCT.	25-27	NEW YORK
DEC.	1-3	SAN FRANCISCO

Effective Writing Skills for Information Processing Professionals

OCT.	13-15	BOSTON
DEC.	1-3	WASHINGTON

Basic First Line Supervisory Skills

SEPT.	13-15	NEW YORK
NOV.	15-17	SAN FRANCISCO

Appraising Performance of the Technical Staff

SEPT.	16-17	NEW YORK
NOV.	18-19	SAN FRANCISCO

Sweet's Seminars

Planning for Computer Usage in the Design Office

SEPT.	22-24	LOS ANGELES
OCT.	4-6	NEW YORK
NOV.	1-3	DALLAS

Computer Aided Architectural Design

OCT.	18-20	SAN FRANCISCO
NOV.	8-10	NEW YORK

Turnkey Systems for Architects

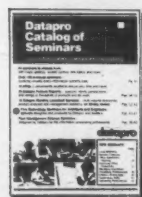
NOV.	15-17	WASHINGTON
------	-------	------------

Using Computers: Alternatives for the Designer

OCT.	25-27	CHICAGO
------	-------	---------

Microcomputer Applications in the Design Office

SEPT.	29-OCT. 1	SAN FRANCISCO
OCT.	13-15	WASHINGTON
NOV.	3-5	CHICAGO



Check your Datapro Seminar Catalog for full course outlines, schedules and details. (If you have not received your copy, use the coupon or call our toll-free number below.) You can also call for instant enrollment or for more information.
Request a free subscription to Seminar News for helpful tips and reminders.

Call 800-257-9406

(In New Jersey, 609-764-0100)

Information that leads to action
datapro

DATAPRO RESEARCH CORPORATION
1805 Underwood Boulevard
Delran, New Jersey 08075
A McGraw-Hill Company

☐ Please register the following person in the program(s) indicated below:

Program _____

City _____ Date _____

Attendee Name(s) _____

Program _____

City _____ Date _____

Attendee Name(s) _____

☐ Please send me a free Datapro Seminar Catalog.

☐ Please send me a free subscription to Seminar News.

☐ Please contact me about Datapro's In-house Seminars.

Name _____

Title _____

Organization _____

Address _____

City _____ State _____ Zip _____

Telephone _____

☐ Datapro Subscriber ☐ Non-subscriber

SSFC CW 9/13

Testing Costs Reduced

Flight Simulations Cut Flaws in Drone Design

SAN DIEGO — For engineers at Teledyne Ryan Aeronautical Corp., the company that designed and built Charles Lindbergh's *Spirit of St. Louis*,

there's no substitute for in-flight simulation.

For one thing, computer simulation of the company's target drones re-

duces the risk of unexpected design errors and produces a final test of system compatibility before the real thing is ever flown.

"It also cuts flight-testing expense," said Philip J. Wall, senior group engineer in charge of dynamics and simulation at Teledyne here. "Two men in the laboratory can perform a simulation while it takes 25 to 30 people to support an actual flight."

Examines Characteristics

With these economy and efficiency measures in mind, Teledyne Ryan Aeronautical installed a real-time system that lets designers examine complex aerodynamic and control characteristics of remotely piloted vehicles (RPV) traveling up to four times the speed of sound and at altitudes as high as 100,000 feet — all by simulation.

Engineers simultaneously evaluate advanced mechanisms and test the software algorithms that control them under simulated flight conditions. The simulator also trains pilots in RPV control techniques.

Used as targets for ground-to-air and air-to-air weapons, some RPVs have the flight characteristics of high-performance fighters and bombers, while others mimic supersonic missiles. In live testing, the vehicles are launched from the ground or from an airplane and fly missions either automatically or under control of a pilot in another location.

"It is necessary to simulate aerodynamic forces on the [control] mechanism in real time to determine true response characteristics," Mike Qualls, senior group engineer, said.

Teledyne uses a Digital Equipment Corp. Decsystem-1090 mainframe because of its strong time-sharing capability, company officials said. "We can run a real-time simulation, which may take 70% to 90% of the machine resources and still continue program development with the remainder," Qualls said.

The Decsystem-1090 has 128K bytes

of main memory and two DEC RP04 disk drives with a total of 176M bytes of storage. Software includes the DEC Tops-10 operating system, Fortran-10, a Link, Inc. overlay loader, the Dibol Debugging Technique symbolic debugger and a Teco text editor.

A DEC PDP-11/40 minicomputer serves as an asynchronous front end to the 1090, providing communications for six CRT terminals, a Decwriter hard-copy terminal, a California Computer Products, Inc. drum plotter and a Versatec, Inc. electrostatic printer. Other peripherals include a TU10 tape transport, a 300 line/min LP100 printer and a card reader.

"Real-time simulation operates entirely from main memory with no swapping from disk," Qualls explained. "The data link provides a window between the 1090 and PDP-11 memories, permitting direct memory access between the two."

Variety of Converters

The PDP-11/15 drives a variety of digital-to-analog converters and receives response from analog-to-digital converters associated with the test fixture. Simulated flight data is recorded on oscillographic recorders on the engineer's console in a manner similar to telemetry data received from a flight test.

Initially the simulation is entirely computer based with no flight hardware involved. Preliminary hardware and software-control system designs are entered into the 1090 and tested against flight regimes in real time.

Engineers can simulate a launch, climb, cruise, turn, descent and recovery following a parachute-aided landing. At any point in the test where anomalies are detected, engineers can stop the test and adjust software parameters, then continue testing under the new conditions. Results are displayed in graphical form, printed and stored in the 1090 files for future evaluation.

While the systems designers are running simulations, the 1090 also permits application software development in the background. Programmers write, edit or modify the vehicle aerodynamics and flight-control packages to meet other test requirements.

As the design process continues, the microprocessor flight-control system and mechanical components are sequentially introduced into the simulation. At a later point, the 1090 is simulating only the structural vehicle and the aerodynamic conditions for the test.

In terms of flight testing of operating personnel, the system allows the operator to control the vehicle with a joystick while observing a large X-ray plotter containing a chart of the area over which the tests will be conducted. The 1090 interprets the control commands and responds with the characteristics of the test vehicle.

In this way, the pilot becomes accustomed to the RPV's idiosyncrasies on the simulator. As Wall said, "It's a lot better to crash a simulator than the real bird."

Info Savvy



You know the guy. He comes into your store with a solid understanding of what he needs. He asks for specific products and the sale is quickly consummated. He's a regular customer and you enjoy doing business with him.

We know this guy, too—he's our typical reader.

INFOWORLD, THE ONLY MICROCOMPUTER NEWSWEEKLY, WILL INCREASE YOUR STORE TRAFFIC AND EDUCATE YOUR CUSTOMER.

InfoWorld educates and motivates so you don't have to. It raises your customers' level of product awareness and understanding. It generates buying activity. People who read InfoWorld know how fast the market changes, they can anticipate trends and make intelligent buying decisions as a result. They're exposed to information on new products, hardware and software reviews, and overall industry activities, every single week.

Do do yourself a favor. Do your customers a favor. Carry InfoWorld, the newsworthy that turns prospects into purchasers. And makes you money. Call today!

Contact InfoWorld's Circulation Marketing Manager at (415) 328-4602 from California, or call toll free, (800) 227-8365 from outside California. Or clip this ad, drop it into an envelope with your business card, and send to:

InfoWorld
The Newsworthy for Microcomputer Users
530 Lytton Ave., Palo Alto, CA 94301.



INFO-TextTM

ARRIVES

SEPTEMBER 29th.

AT THE FEDERAL COMPUTER CONFERENCE, BOOTH #630.



HENCO SOFTWARE

100 Fifth Avenue
Waltham, MA 02154
(617) 890-9670
TWX: 710-324-7701

Free Brochures

• A free report comparing tools for the Hewlett-Packard Co. HP 3000 computer is available from Data Systems.

Among the tools compared are HP's Rapid group, including Transact, a transaction processor; Report, a general-purpose report writer; Inform, a high-level report writer; and Dictionary/3000. Quasar Systems Ltd.'s Powerhouse group of products includes the Qschema data dictionary.

Gentry, Inc.'s programmerless applications language, a high-level report writer; REX/3000, a general-purpose report writer; EZV, a screen handler in a REX program; and the DD data dictionary are also compared.

The "HP 3000 Productivity Product Comparison Report" is available from Data Systems at Suite 300, 11260 Roger Bacon Drive, Reston, Va. 22090.

How Do You Fight Personnel Cuts?

Q Profits are down drastically and management has opted for what it felt was the most equitable solution: a 25% across-the-board cut in personnel. To DP, this means a cut from 19 to 14. Since at least six DPs are actively seeking employment elsewhere, the reduction problem will solve itself.

I've asked management to maintain the current level and to authorize replacements for those who are almost certain to resign in the near future. Management has rejected both requests and is standing firm on the 25% cut.

With attrition and no authorization to recruit replacements, we could be down to nine or 10 people within three or four months.

My concern is how we will provide the same services, maintain what we have and reduce our backlog of requests. Do you know of other DP departments that have successfully coped with an across-the-board cut in personnel?

A The state of the economy has dealt most of us a low blow. But based on my observations (not statistical evidence), the majority of companies that have been forced to cut back personnel have refrained from imposing any significant reductions on their DP departments. For the most part, the decree to DP has been to reduce the recruiting quota.

It is incumbent on you to explain to top management that you can't do X work with 19 people and X-plus work with 10 people. Unless a relational decision is made to at least maintain the status quo, certain DP-dependent operations are going to come to a screeching halt.

Q My current position is services supervisor with an excellent company, but there is no future in this field. I have gained five years' supervisory experience in business while going to school, but no computer experience.

Five years ago, when I was working toward a degree in information systems, all the magazines and newspapers touted the dawning of the information age and reported that the insatiable demand for programmers and DP personnel would outstrip supply for the next 30 years at least. Now that I've graduated, I hear and read that programmers are becoming obsolete. Distributed processing, packaged software and personal microcomputers are eliminating the need for DP personnel, while at the same time schools are turning out droves of people in information processing.

If you were starting your career today, would you enter a DP area like programming, systems analysis or data base management... or would you enter a user area like marketing or finance?

A I, like just about everybody else in the '60s, entered DP more through circumstances than through a conscious choice of alternatives. I started out as a systems engineer with IBM.

The information systems industry is in its infancy. I'm very optimistic

about the career opportunities for bright, creative people entering the DP field. There are at least as many opportunities for people with degrees in information systems as there are in any of the functional area disciplines, save perhaps engineering.

The recession has forced many companies to impose hiring freezes, but DP is often singled out as the exception.

The complexion of the programmer job function may change radically over the next decade, but will it become obsolete? Never! There are untold numbers of applications that must be designed and programmed. Unfortunately, the information revolution is paralleled by a recession. Look for an information explosion and the

demand for skilled DP professionals to be again insatiable.

Q I just read your response to a question about management information systems (MIS) vs. computer science college curricula. Why is it that so few colleges offer degrees in business systems analysis and design?

A Business systems analysis and design is a subset of MIS or information systems curriculums. At the undergraduate level, the student would normally take two or three courses in systems analysis and design.

A few colleges still offer degrees titled systems analysis and design, but I would expect them to be changed to

Turnaround Time By Larry E. Long



MIS or information systems in the near future to reflect the breadth of the career field.

Long is a professor at Lehigh University, a DP consultant and author. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.

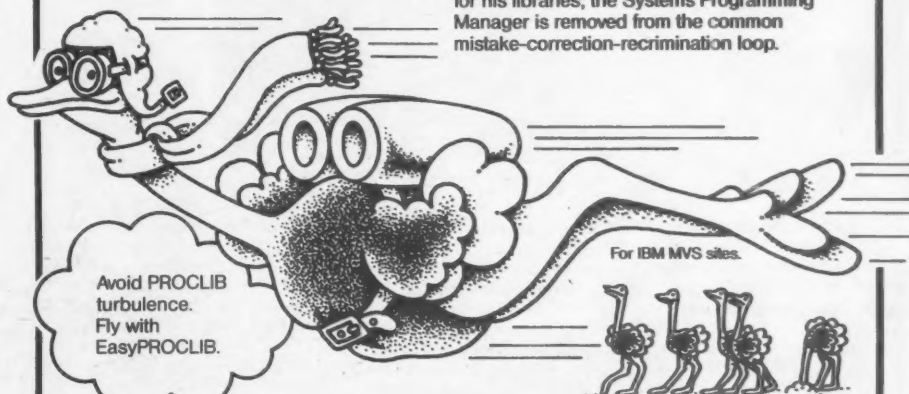
Efficiency begins with EasyPROCLIB and a decentralized procedure library.

EasyPROCLIB revolutionizes traditional IBM Procedure Library use. At last, your users can catalog procedures in private libraries.

EasyPROCLIB reduces system PROCLIB maintenance. Continual updating and concatenations to SYS1.PROCLIB are drastically reduced. EasyPROCLIB eliminates the predefinition of the user PROCLIB data sets by the systems staff. It also eliminates the perpetual maintenance of the related DD cards in the JES procedure. No time is spent on maintenance tasks created by user errors.

Under EasyPROCLIB, library failures can't become catastrophes. The user alone is responsible for the creation and maintenance of his procedures and libraries. If the user crashes his private library, a diagnostic message notifies him, and he is responsible for repairing or restoring it. The damaged PROCLIB does not affect the whole system or other users.

EasyPROCLIB reduces contention between users and the systems staff. With EasyPROCLIB, each user is solely responsible for his libraries; the Systems Programming Manager is removed from the common mistake-correction-recrimination loop.

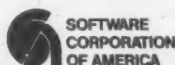


Avoid PROCLIB
turbulence.
Fly with
EasyPROCLIB.

For IBM MVS sites.

CALL
703-471-1545

for an Information Pack on how to "TEST FLY"
EasyPROCLIB for 30 days, or fill out the
coupon at right.



455 Carlisle Drive, Herndon, VA 22070

☐ Yes, please send my Information Pack which tells how I can
"TEST FLY" EasyPROCLIB for 30 days! CW 9/13

Software Corporation of America
455 Carlisle Drive
Herndon, VA 22070
703-471-545

Name _____ Title _____
Phone _____
Company _____
Address _____
City _____ State _____ Zip _____
OP SYS _____ CPU _____

Restaurant Management Program

College Chef Feeds Many With Micro's Aid

By Jim Bartimo
CW Staff

RIVER GROVE, Ill. — When families gathered for Labor Day celebrations last week, they had to conquer the problem of how to cook for a large group of people. But at Triton College's Hospitality Industry Administration Department here, a mainframe and a microcomputer teamed up to change a recipe for four into a meal for 44 with the push of a button — a trick that might have come in handy if unexpected members of the family had shown up for dinner.

Czechoslovakian-born chef Michael D. Klima, an instructor at the

college, came up with the idea of a computer program that could instantly convert his recipes to serve large groups when he was the executive chef for Marriott In-Flight Kitchens, which supplies in-flight meals for such international airlines as Air Canada and Swiss Air.

When Marriott would not go along with his idea, he eventually left the caterer to teach full time, learn how to program in Basic and put his recipes onto an Apple Computer, Inc. microcomputer.

After conferring with Triton College's DP department more than a year ago, Klima hooked up a modem to the micro and transferred all 1,000

recipes to the college's Burroughs Corp. B6800 mainframe, where they are now accessed by students in the restaurant management program.

Klima drew his recipes from his experience as Marriott's chef, his job in his home country as chief chef for Czechoslovakia Airlines and from his four books on international cooking. He emigrated to the U.S. in 1968 when the USSR occupied the Eastern Bloc country.

How does Klima's computer program work? "A student is assigned to make beef stroganoff. He searches through all the beef dishes until he finds it. Then he punches in how many he is cooking for," and the pro-

gram changes the proportions of the ingredients to fit the crowd, Klima explained. A task that would normally take up to a half hour is calculated instantly, he said.

The program will also calculate how much the meal will cost to prepare so a student or restaurant manager can figure the cost of cooking for different-size groups or project prices for a menu, Klima noted. An enhancement to the program will soon allow Klima to record which student cooked which dish and what his grade will be.

Added Benefit

An added benefit is that the student can print out the recipe and refer to it in cooking class, where cookbooks are easily soiled, Klima said.

Students currently prepare meals for the faculty and staff of 60 and other meals for the banquet room. The program prevents them from serving the same meals twice in one semester.

"It's not unusual anymore to see a computer in the kitchen," the chef said, pointing out that many large food service organizations are using computers for the same purpose. "When our students are looking for a job, they can say they worked with a computer."

"People are scared of computers because they don't know what they can do," Klima said of his unusual crossover from chef to programmer. "One day, every family will have one. The housewife will punch in what she has left in the ice box and the computer will tell her what she can make."

OA Seminar to Cover Facility Management

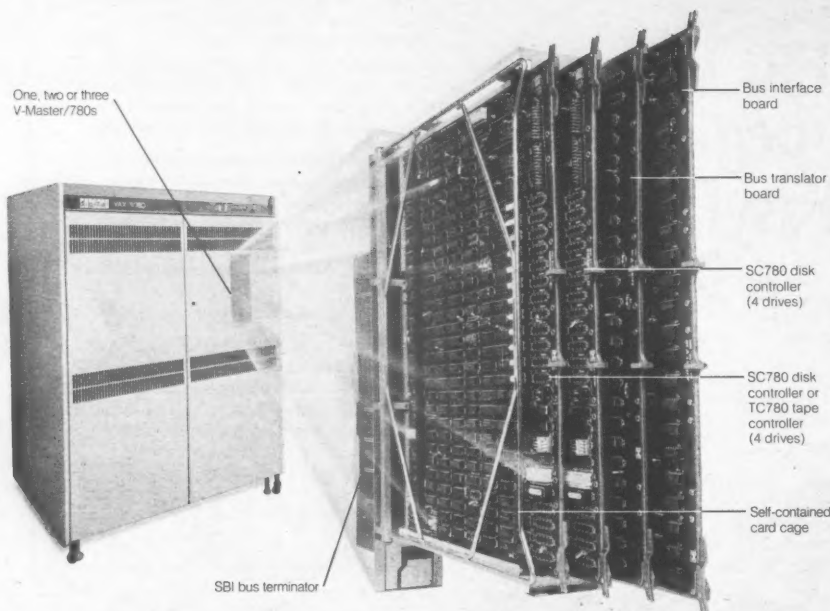
ANN ARBOR, Mich. — The Facility Management Institute (FMI) will sponsor a four-day seminar here Nov. 30 to Dec. 2, entitled "Office Automation: The Facility Management Perspective."

The seminar will explore reasons why new standards must be developed, how better standards can affect management's bottom-line in office automation, the assessment of future computer applications in white-collar work and existing national and international guidelines and standards for technology in workstations.

The seminar was designed to provide managers responsible for facility decision making and management with a method and sufficient content to develop and implement new facility standards to support the use of technology in office environments.

The registration fee is \$500, FMI said from 3971 S. Research Park Drive, Ann Arbor, Mich. 48104.

Emulex takes the inside track on VAX-11/780* mass storage.



Announcing V-Master/780. A whole new packaging concept in software transparent mass storage adapters for VAX-11/780.

Simpler, less expensive, more reliable.

Just what OEMs and system integrators need. Two V-Masters can fit right into the internal RH780 spaces for control of up to 16 drives. And a third will replace the SBI terminator. The result: Add more peripherals without adding an expansion cabinet.

Each V-Master chassis has four slots. Two boards interface with SBI; the other two can contain fully-overlapped SC780 disk and/or TC780 tape controllers. Reliability improves because of fewer components, boards and interconnects.

Increase performance, improve flexibility.

The disk and tape controllers are the same high performance boards we use for VAX-11/750. By using dual disk controllers you boost multiple drive performance significantly. Or mix tape and disk controllers in the same chassis for less cost, more flexibility.

And you get all the other Emulex benefits, too. Like the ability to mix drive types and capacities. Unlimited selection of peripheral make and model. SMD media compatibility.

Now available as complete subsystems.

Choose from a wide selection of peripherals up to 675MB. We test each system nearly 100 hours and do

our own installation. Nationwide and regional service organizations provide timely maintenance.

Look into our unique rental/purchase plans. You can even trade in your old non-DEC controller.

Call Emulex now toll-free: (800) 854-7112. In California (714) 557-7580. Or write: Emulex Corporation, 2001 E. Deere Ave., Santa Ana, CA 92705. TWX 910-595-2521.



The genuine alternative.

*VAX and VMS are trademarks of Digital Equipment Corporation. The VAX-11/780 shown is manufactured and marketed exclusively by DEC.



"Moss on the Keys?"

Computer Files Digesting Best Protein Combinations

PHILADELPHIA — Two plants — neither of which are good sources of protein alone — may be greater than the sum of their parts when combined. So Drexel University instructor Stephen Dubin uses Digital Equipment Corp. PDP-12 and Prime Computer, Inc. Prime 400 minicomputers to figure out which of many combinations of wheat, flour, soy and other plants will provide a cheap, complete source of protein.

"The computer has a set of files called The Stomach," Dubin said of his program, designed to balance the essential amino acids in plants for efficient protein use in the body.

This source of protein would be beneficial for vegetarians, areas of the world where food is scarce and for patients in need of a controlled diet.

"I came upon the problem that people have with kidney problems who can't excrete proteins they don't need. You could live on a diet of meat every day because your body could excrete the extra protein it doesn't need. But someone with kidney failure couldn't do that. They need a controlled diet," he explained.

"If a kidney patient asked the hospital dietician how to alter his diet so

he could have pizza and beer one day, the dietician would say, 'You can't.' It takes about 4½ hours to figure out a diet for a patient with kidney failure."

"I try to predict the body's reaction to different kinds of proteins and how efficiently it may use the protein," he said.

"I started out with this because I'm a vegetarian, and I'd often heard it said that vegetarians have a hard time getting enough protein," Dubin said.

While protein is more readily available in meat, different plants supply different amounts of essential proteins.

Intro to Micros Offered to Execs

CHICAGO — Arthur Andersen & Co. will sponsor a two-day course in introducing business professionals to microcomputers in several cities this fall and winter.

The course was designed for managers and executives who have little or no prior experience with microcomputers, but want to understand their potential in the business environment.

The courses have been scheduled to be held in Chicago (Oct. 18-19, Nov. 15-16 and Dec. 20-21); Dallas (Nov. 4-5 and Dec. 2-3); Washington, D.C., (Nov. 17-18 and Dec. 28-29); and San Francisco (Nov. 22-23).

The registration fee for the seminars is \$500, Arthur Andersen said. Further information can be obtained from the Center for Professional Education, 1405 N. Fifth Ave., St. Charles, Ill. 60174.

Agency Insures Personal Computers

COLUMBUS, Ohio — The Columbia National General Agency (CNGA) has announced a comprehensive insurance policy for personal computer owners.

The insurance program, called Safeware, insures processors for a variety of mishaps including fire, theft and accidental damage, according to the firm.

An annual premium for a typical system consisting of a \$3,500 processor, a \$1,600 printer and \$900 worth of programs costs about \$60/year with a \$50 deductible, according to the agency.

CNGA is located at Suite 1800, 88 E. Broad St., Columbus, Ohio 43215.

CICS COMMAND LEVEL EDUCATION

Learn CICS COMMAND LEVEL programming efficiently and effectively.

In depth courses are being offered in CICS COMMAND LEVEL programming at the following location:

• Chicago

Oct. 25-29, 1982.

Please contact Systems Dimensions, Inc. to make reservations. Reservations should be confirmed no later than two business weeks prior to the seminar.



Systems Dimensions Inc.
24902 W. Middlefork Rd.
Barrington, Ill. 60010
(312) 382-5420



Advanced Technical Education

- Computer Workshops with hands-on training
- Professional Data Processing Instructors
- Comprehensive student reference material

DATA COMMUNICATIONS

	Oct.	Nov.	Dec.
CICS/VS Macro-level Applications Programming CICS01 • Design, code and debug CICS/VS macro-level application programs • Invoke program, file, terminal and data management services • BMS input/output mapping		1-5	
CICS/VS Command-level Applications Programming CICS02 • Design, code and debug CICS/VS command-level application programs • Invoke program, file, terminal and data management services • BMS input/output mapping	4-8 18-22 25-29	8-12 15-19	6-10
CICS/VS Testing & Debugging CICS03 • Use program dump to diagnose abends • Apply Trace, Dump and EDF facilities • Testing techniques for CICS/VS environment • Program testing and debugging workshop	9/28-10/1	8-11	11/30-12/3
CICS/VS Application System Design CICS04 • Design systems that utilize CICS/VS facilities effectively • Use program, file, terminal and data management services • Format screens using BMS and 3270 IDS facilities	12-15		11/30-12/3
DMS/CICS/VS Design and Programming DMS01 • Generate on-line applications • Utilize supervisor and system functions • Code calculation, edit, control routines • Apply panel hierarchy techniques	12-15		

DATA MANAGEMENT

VSAM File Management & Programming VSAM03 • Design VSAM file structures • Use AMS commands to manage VSAM catalogs, data space, datasets • Create and use alternate indexes • Load, read, update and extend key or entry-sequenced datasets	18-22	15-19	
---	-------	-------	--

DATA BASE TECHNOLOGY

DL/I Applications Programming DL01 • Logical/Physical data base structures • Code DL/I calls to retrieve, update, add or delete segments • Build segment search arguments • Process status codes • Establish data base position	25-27	15-17	
IMS/VS Data Communications Programming IMS02 • Describe IMS/VS message flow • Code DL/I calls to send and receive single or segmented messages • Design and code conversational programs • Use batch message processing facility	28-29	18-19	

PROGRAM & SYSTEM DEVELOPMENT

ON-LINE Application Systems Design SD02 • Define on-line system requirements • Develop specifications and controls • Describe screen design procedures • Manage on-line files/data bases • Describe communication network components	9/29-10/1	3-5	13-15
OS/VS JCL Advanced Features & Utilities JCL03 • Prepare, update and execute catalogued procedures • Code job restart procedures • Manage datasets • Select correct utility for specific function • Code JCL to execute utility	9/28-10/1		

Inquire about availability of courses at client site

For registration materials and further information on specific courses, circle appropriate course numbers on coupon and mail to:



800-223-7822
In N.Y. State Call COLLECT
(212) 921-8676

A Subsidiary of Spiridellis & Associates, Inc.
CompEd Technical Corporation, Inc.
1133 Avenue of the Americas, New York, N.Y. 10036



Spiridellis & Associates, Inc.

Yes, please send me information and registration materials for the courses circled below:

CICS01 CICS02 CICS03 CICS04 DMS01
VSAM03 DL01 IMS02 SD02 JCL03

NAME _____

TITLE _____

PHONE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

☐ Please send information on future schedules.

☐ Please send information on Client-site courses

User-Supplier Alignment Can Cut Software Costs

By Neerja Sethi
Special to CW

Software costs have constantly been on the increase, both as a percentage of the overall DP budget and in absolute value.

Software budgets are increasingly coming under the ax, yet there is an ever-exploding demand for additional software from the users. This demand can be satisfied, provided software costs can be reduced.

Careful planning and an understanding of the reasons behind very high costs can give management the controls to bring these costs down substantially.

Why Costs So High

Several reasons are commonly advanced for continually rising software development costs. These include escalating manpower costs, costs associated with high turnover, constantly changing system specifications, low productivity due to the contention for limited computer resources between development and on-going activities and heavy overtime costs.

Management is hard pressed to control these costs and often finds itself unable to do so.

A closer look at the situation, however, reveals that these commonly perceived causes are mere side effects and are not the root of the problem. The real cause of the problem lies in the logistics of the development process itself, because conflicts

are inherent in the goals of the various parties involved in the development cycle.

Regardless of the route chosen for the acquisition of a software product, there is generally a fundamental divergence in the objectives of the users and the suppliers. This divergence is clearly evident in the following commonly used modes of software installation:

- **Contract Programming.** The revenues of the contracting company are directly proportional to the duration of the project and the number of people it has working on the account.

The company has no incentive to deliver the product in the shortest possible time frame; its organizational makeup would be clearly biased toward extending the project to maximize revenue.

Also, the staff of these companies have no professional stake in the timely and cost-efficient implementation of the project.

- **In-House Development.** In most organizations, DP is a support function isolated from the mainstream of the business. Management has few tools to measure the productivity of DP departments or the efficiency of their services from a corporate standpoint. Company politics often create conflicts between users and support groups.

Projects are sometimes started prematurely — without a thorough analysis — to keep users content. For department heads, larger budgets

have traditionally meant larger empires. Programmers, who get paid for working additional hours, can see no reason not to work extra hours, and are seldom rewarded for accomplishing a given task most cost-effectively.

The need to watch costs is seldom perceived. Heavy overtime is considered as evidence that an all-out effort is being made to deliver the product on time. Project slippage and associated cost overruns are considered normal.

- **One large organization monitors system development on weekly activity summary sheets. One of the items on the summary sheets reads, "Reasons for slippage."**

- **Customized Packaged Software.** Packaged software is an attractive alternative because it can generally be acquired for a fraction of the development cost. This initial cost, however, can be grossly misleading and, in many instances, is just the tip of the iceberg.

Modifications are needed to customize the package and to make it compatible with in-house software. The customizing is normally carried out by vendor personnel at premium rates.

Management seldom makes an attempt to hold the vendor to a firm price; it settles for a ball-park estimate, which for obvious reasons is scaled down and often has no bearing with reality.

Software package vendors often

have custom programming as a planned source of revenue; they are seldom rewarded for delivering the product under budget. Consequently, many customized packages end up costing several times the initial planned cost.

- **End-User Computing.** The users' lack of understanding of the capabilities and limitations of the hardware and the software can present serious problems. There is a tendency on the part of the user to view the problem from his narrow focus, without taking into consideration the impact on various interrelated activities.

The user cannot be expected to have a full grasp of various design considerations necessary for structured system development. Moreover, the system overheads of this process are substantial and the possibility of major disasters, due to ignorance, is very real.

Holding Down Costs

The key to holding down costs lies in resolving goal conflicts, by aligning the goals of the party installing software with the goals of management.

Management should concentrate on its main line of business and transfer the risk of any major development or enhancement effort to professional organizations that are in the business of supplying software.

Software houses will be forced to take up the role of professional risk

(Continued on Page 33)



Proven hardware.

Last year Control Data sold more than \$1 billion of peripherals. That's a lot of experience in meeting customer needs for greater reliability and better price/performance.

We know hardware and we know large systems. And as the world's leader in peripheral technology, we know how to help you reap the full potential of your IBM mainframe. Call us. 612/853-7600.

CD CONTROL DATA

Addressing society's major unmet needs
as profitable business opportunities



Value-added software support.

Control Data has one of the world's largest software teams working exclusively on IBM operating systems.

Why? Because the right software support is needed to get all the performance possible from your IBM system — in-depth software support just not available from an ordinary "PCM." Call us. 612/853-7600.

CD CONTROL DATA

Addressing society's major unmet needs
as profitable business opportunities

Mail Order Made Easy

Doll Trade Mere Child's Play With System

BIG SANDY, Texas — They were born on a used kitchen table in a small town of 1,100. They can't even stand up on their own, but Sue and Sam have a computer in their garage.

Sue and Sam, also known as Sunbonnet Sue and Overall Sam, are rag dolls. They're the basis of what has become a multimillion-dollar business for Jerry and Anita Gentry.

Back in 1975, Anita Gentry decided to try her hand at needleworking. She created Sue and Sam and decided to go into business selling the

dolls as well as other needlecrafts under the shop name of Annie's Attic.

Since then, the business has literally consumed the Gentry's home and three others in their neighborhood. What used to be the family garage is now the computer room housing two IBM System/38 Model 5 processors with 2M bytes of main memory each. There is also a restaurant, gift shop and a newspaper, according to Anita Gentry.

Annie's Attic now employs 125 of

the 1,100 local residents, the largest employer in Big Sandy. Through the firm's mail order business, hundreds of orders arrive at the Big Sandy post office each day. Those orders are filled using 40 IBM 5251 Model 11 terminals attached to the two System/38s, Jerry Gentry said.

"With the computer, we can find out anything anybody has ordered since 1977 [when the firm was using an IBM System/34 processor]," Gentry explained, adding that a mailing list of about 900,000 is stored in the

processor.

At one point, before automating the operation, Gentry said there was about a six-week delay in processing orders. Now orders can be processed in a couple of days.

Labels are printed automatically, Gentry said, and the processor automatically calculates postal charges. As each order is entered into the system, the processor automatically posts the transaction to the customer's account and makes any necessary corrections to the firm's mailing list, Jerry Gentry said.

Since customers who sew don't necessarily crochet, the system keeps track of each customer's buying habits and can produce a segmented list for a target mailing. The system can also be used to spot trends, such as when the list of customers crocheting jumped from 20,000 to 100,000 during the first nine months of 1979. Likewise, the system can be used to monitor which ads get the best response and to keep track of inventory, Gentry said.

When customers phone in their orders, an operator can call up the customer's account on a terminal. In addition, the company payroll and general ledger is processed on the system, Gentry said.

"Everybody dreams of success, but I have to admit that my dreams never went to this extent," Anita Gentry said.

User/Supplier Alignment Lowers Costs

(Continued from Page 32)

takers in the developmental process. Their business will change from providing a service to supplying a well-defined product.

Software houses, with their pool of talent, will be forced to deliver on time, since this would directly impact their bottom lines. They will be forced to devise means of streamlining the development process.

This kind of buyer-supplier relationship is commonplace for engineering products. There is no reason why a similar arrangement cannot exist for software products.

Most important of all, this scenario will lead to an alignment of the goals of the users to those of the suppliers. Management will be able to meet its

objective of acquiring a product for a budgeted price.

Competitive bidding for turnkey product delivery will exert downward pressure on costs and will result in a dramatic increase in programmer productivity.

Examine Requirements

For this arrangement to work successfully, management should critically examine all system requirements. Users should do an in-depth analysis of their functional computing needs and should clearly define their objectives and the boundaries of each system.

Software development should be viewed as a partnership effort with sufficient rewards and substantial

stakes for all parties involved in the project.

The common perception is that such an arrangement is not possible and that vendors will not front the risk of software development. Nothing could be further from the truth.

Lately, some organizations, weary of the pitfalls of the software development process, have been soliciting firm bids for well-defined tasks. Results show that competitive factors led vendors to deliver the products below management's expected costs.

The conclusion we come to is that the responsibility lies with upper management to initiate the process.

Neerja Sethi is vice-president of Systems International, Inc., a consulting firm in Troy, Mich.



Systems-smart service.

Control Data operates some of the largest DP systems and networks in the world. So we know your service needs because we have them, too.

That's why we have thousands of customer engineers to back up our products. Trained in IBM systems, they know how the hardware works within the system. Or in your network. Our systems-smart service team even knows how to fix your IBM mainframe. Call us, 612/853-7600.

CD CONTROL DATA

Addressing society's major unmet needs
as profitable business opportunities



Other PCM's sell you product. We meet your needs.

That's how Control Data has become the world's largest independent supplier of computer peripherals.

And why we have:

- ✓ proven hardware
- ✓ value-added software support
- ✓ systems-smart service

and thousands of satisfied customers. Call us.
612/853-7600.

CD CONTROL DATA

Addressing society's major unmet needs
as profitable business opportunities

College Finds Basic Blocks for Growth in System

TEMPE, Ariz. — "It simply wasn't an either-or decision... what we needed was a building block that could stand on its own — a system that would meet all our present needs, keep up with our steady growth and still fit neatly into our program five and 10 years from now."

Those were the sentiments of Dr. William E. Lewis when he went shopping for a computer system two years ago. Lewis is the chairman of Arizona State University's (ASU) College of Engineering and Applied Sciences' computer science department.

The college had outgrown its tie-in with the central campus computer system, and it was looking for something that promised a "good fit" and "growing room." High on the list of system requirements was the ability to serve a variety of masters including students, faculty, researchers and staff members whose respective computer expertise ranged from the proficient to the strictly elementary.

ASU Requirements

The college purchased Honeywell, Inc.'s Multics 68/80 computer system which, according to Lewis, has the mix of flexibility, security, operating ease and power to meet all ASU requirements.

With more than 4M bytes of main memory, 800M bytes of disk storage and a data transmission rate of up to 9,600 bit/sec, the Multics systems supports all the users and their research. The system's built-in virtual-memory feature is considered an added bonus by Lewis because it expands the computer's own memory banks by pulling in program instructions a block at a time during complex

Directory Details On-Line Services

DELRAN, N.J. — Datapro Research Corp. has published the *Datapro Directory of On-Line Services*, said to describe more than 100 on-line services and 500 data bases by product, vendor, application and pricing.

Each product is also cross-indexed to all its related listings, and the book reportedly features a general index and indexes of applications, companies and data bases.

The subscription rate is \$390 with an introductory rate of \$340 for the two loose-leaf volumes, 12 monthly update supplements and newsletters and use of the firm's telephone inquiry service. Datapro is located at 1805 Underwood Blvd., Delran, N.J. 08075.

computer runs.

Currently the Multics system consists of 32 communications lines tied into a single front-end processor. Ten of those lines are available for phone-in remote access; the rest are located in faculty or administrative offices and student terminal centers, Lewis explained.

Multics is being used for several on-going ASU projects involving analytical

modeling, language research and software engineering. Other projects in the works include administrative and classroom applications, Lewis said.

The word processing capabilities have already cut down the work load of faculty and secretaries, according to Lewis. Another popular feature is the electronic mail function, which transmits messages automatically from one user to

another and eliminates most interoffice and intradepartmental memos.

In their programming classes, students are prompted step-by-step through program entry and editing, Lewis said. An arsenal of on-line "help" information is at the students' fingertips, and Multics debuggers are reportedly fully interactive in all system languages, including Fortran, Cobol, PL/1 and

APL.

Lewis claimed that "our faculty is working with resources as good as they'll find anywhere in the industry," which he has felt thankful for at recruiting time.

"Being able to say to potential faculty members, 'We've got a Honeywell Multics' has been a real boon in our recruitment efforts."



DBMS Backs Accountants, Analysts

Managers Use Desktop Terminal to Access Data

DANBURY, Conn. — An informational management system accessed through desktop terminals in each manager's office has made gathering current data on-line "a part of the work habit" for the corporate controller and his staff at Union Carbide Corp. here.

Based on Infodata Systems, Inc.'s Inquire data base man-

agement system, Union Carbide's Management Inquiry and Display System (Miad) "combines the allure of personal computing with the power of our mainframe data base," assistant controller John McAssey said. "The result is an emancipation of information," he added.

Miad was designed to enable corporate accountants and

analysts to retrieve and display the Union Carbide worldwide consolidated financial data. A macro-driven software program has been developed to enable the assistant controller's group to create on-line reports and monitor each company's performance within Union Carbide Corp.

"No longer does a manager

have to go to systems technicians for nourishment from the data," McAssey said. "He can sit in the privacy of his office and develop reports that assist him in his work. He can ask a question that is a combination of several issues," McAssey noted that these capabilities are especially interesting to managers in the 45-plus age group

who haven't had the benefits of growing up in the computer age.

Before Union Carbide developed Miad, management had two alternatives for gathering information, McAssey explained. The first option was to request a report through several layers of people. The second alternative was for the manager not to ask any questions and just work with limited information. "Unfortunately, no news is not good news," McAssey said. "It hurts when you have to shoot from the hip, and many opportunities can be lost because questions are not answered with current, complete data."

Requirements

Among the requirements for the Miad system was the ability to interface with the company's GL/80 general ledger package from Management Science America, Inc., he explained. Beyond this, it had to be usable by nonprogrammers, interactive and able to handle hierarchies of components/accounts/time periods. Other desired features were statistical routines and "what if" capabilities.

Financial managers were asked to examine several available software packages, and they ran a pilot test using data from the corporate consolidation data base. Then McAssey, Paul McKeever, manager of corporate accounting systems; and director of corporate accounting Jim Fields visited the Union Carbide Information Center in South Charleston, W. Va., to see demonstrations of other possible solutions, including Inquire.

Because Inquire fulfilled the listed Union Carbide requirements for the Miad project, it was selected and a task force of potential management users began work on installing the system.

Fields and McKeever, both members of the task force, worked closely with the firm's Information Systems Development department to design 20 screens for accessing information from five financial data bases in the Miad system. Each menu was test-formatted on a Wang Laboratories, Inc. terminal, printed out for concurrence by the task group and then incorporated into the Inquire Miad system.

In less than four months, the Miad system was complete and running, and the information could be accessed by a number of different terminals currently available to the users.

GREAT SOFTWARE ISN'T WRITTEN. IT'S ENGINEERED.

Software engineering means hardnosed quality control. It means extensible architecture. It means strict specifications for reliability and durability.

Each provided through intensive research, a disciplined development process and a commitment to excellence.

ENGINEERING FOR THE INFORMATION CENTER.

If backlog is jamming your responsiveness to end-users and you want a strategic, dependable solution you can build upon, you need advanced technology software engineering. And that's what you'll get from Informatics® Answer® Series software products. The Answer Series satisfies just about every information need your end-user can come up with. "Do-it-yourself" tools for them. Control for you.

ENGINEERING FOR THE APPLICATION DEVELOPMENT CENTER.

Don't compromise your mainstream applications with short term approaches. Longevity, efficiency and reliability are crucial. Engineered software is even more important here. Informatics Mark® Series application generators make your data processing efforts more effective. They increase application programming productivity from two to five times above current levels. Your entire staff can reach new levels of productivity.

It takes the resources of a company like Informatics to meet the information challenges of the 80s. We will continue to be a dominant force in leading edge IBM installations throughout the world. After all, we've been decreasing backlog, increasing productivity, and engineering great software for over 20 years.

Informatics General Corporation, Software Products Group, 21050 Vanowen St., Canoga Park, CA 91304, (213) 716-1616.

THE SOFTWARE ENGINEERS

 **informatics**
general corporation



CONVERSION

are you . . .

- Emulating/Simulating?
- Consolidating?
- Changing Computers?

If your program logic is still useful, there is no need to go through the expense and inconvenience of a rewrite or redesign. With Dataware's Software conversion services experience you will save time, money and manpower. Dataware, Inc., is the leader in the conversion area and the only company that offers a full line of conversion software and services. Listed below are eight Dataware Translators most often needed.

- COBOL to COBOL
- AUTOCODER/SPS to COBOL
- EASYCODER/TRAN to COBOL
- BAL/ALC to COBOL
- DOS/ALC to OS/ALC
- PL/1 to COBOL
- RPG/RPG II to COBOL
- RPG/RPG II to PL/1

In addition to Translators, Dataware has Utility Packages that are useful in a conversion environment. Two of the most widely used are:

- FILECOMP
- TEXT COMPAIRATOR

Facing a conversion situation? Call or write today!



Dataware, Inc.
The Conversion Software People

2565 Elmwood Avenue, Buffalo, NY 14217 • (716) 876-8722 • TELEX: 91519

Mortgage-Tracking System Cuts Costs, Staff Levels

BOSTON — Cuts in both costs and staff requirements have resulted from a newly implemented mortgage-tracking system at the Mutual Bank for Savings here.

The system, which consists of Inform software from Cortez Corp. of Wellesley, Mass., coupled with a Digital Equipment Corp. (DEC) PDP-11/70 minicomputer, reportedly enables on-line interviews, quick determination of appraisal and credit status and rapid log and report generation. "What used to take weeks to determine now takes minutes to locate and then to generate," according to loan officer Anne F. Craigs.

The Inform Mortgage Tracking Sys-

tem decreases the amount of time the bank needs to qualify applications and make loan commitments, while it lowers the cost of processing mortgage applications with its automated procedures, Craigs claimed. For example, Craigs said the system automatically prepares forms on a daily, monthly or ad hoc basis helping to complete transactions and ease compliance with government requirements.

Move to On-Line

Prior to installing the new system, Mutual Bank had two interfacing departments arranging mortgage loans: the Appraisal-Underwriters group and the secretarial department. Out of the 13-18 employees, three to six appraisers reviewed properties and made recommendations for loans, while five to nine secretaries completed the required typing and paperwork. Delays and losses frequently occurred in this backlog of paperwork, according to Craigs.

The move to an on-line system consolidated these two departments, reduced the number of appraisers, and upgraded the secretarial positions.

Mortgage loans are now handled in a single department consisting of nine workers: two appraisers, four fee appraisers and three interviewers or mortgage representatives, who input application information directly into the system via DEC VT100 terminals.

Significant Labor Savings

Craigs maintained the reorganization has resulted in significant labor savings in the bank's Origination Department and, more importantly, better customer service. "Besides getting all of the management reporting data we want and need by pushing a few buttons," Craigs said, "the system has allowed us to project a much more professional image to the customer."

Furthermore, the Inform Application Development System has not only accelerated applications development time by up to 10%, but performance is reportedly up some 60%.

In conclusion, Craigs cited the bottom line of the system implementation: "The tracking system has allowed us to be more competitive with other financial institutions in our quality of service."

Newsletter Debuts On Computer Crime

ANNANDALE, Va. — Washington Crime News Services and the National Center for Computer Crime Data have joined forces to produce a new monthly newsletter, "Computer Crime Digest."

The periodical will address investigative, accounting and prosecution problems facing law enforcement and security officers, according to the publishers.

Free copies of the prepublication issue of "Computer Crime Digest" are available from Washington Crime News Services, Suite 400, 7620 River Tnpk., Annandale, Va. 22003.

Your Key To Success... DP Training At Chubb Advanced Training Center "Training By Professionals For Professionals"

IMS TRAINING

IMS Data Base Access DL/1.....\$445
October 4-6.....New York City
December 6-8.....New Jersey

IMS Data Communications.....\$345
October 7-8.....New York City
December 9-10.....New Jersey

OS/VS TRAINING

Job Control Language.....\$445
October 18-20.....New Jersey
November 30 - December 2.....New York City

MVS Dump Debugging.....\$445
October 4-6.....New York City
October 26-28.....New Jersey

VSAM in COBOL.....\$395
November 8-10.....New Jersey

ANS COBOL.....\$975
November 22 - December 14.....New Jersey

EVENING TRAINING

MVS Dump Debugging.....\$445
October 12-21.....New Jersey

CICS Command Level Programming.....\$595
October 19 - November 18.....New Jersey

CICS TRAINING

CICS Command Level Programming.....\$595
December 6-10.....New York City

SYSTEMS TRAINING

Systems Analysis Workshop.....\$695
December 6-10.....New York City

USER TRAINING

Introduction to Data Processing.....\$175
November 8-9.....New York City

Data Processing for the
Non DP Executive.....\$395
November 15-17.....New York City

ENTRY LEVEL TRAINING

45 days COBOL Programming.....\$3100
October 12 - December 14.....New Jersey
December 6 - February 4.....New Jersey

60 days COBOL and OS.....\$3300
October 12 - January 6.....New Jersey
December 6 - February 28.....New Jersey

75 days COBOL, OS and Workshop.....\$3500
October 12 - January 28.....New Jersey
December 6 - March 21.....New Jersey

Registration for three or more attendees from the same company per seminar will receive a 10% discount.
(Does not include Entry Level Training)



ADVANCED TRAINING CENTER
A Division of Chubb Institute
480 Morris Avenue
Summit, New Jersey 07901

(201) 467-7680

Yes, please send catalog information.

Name/Title _____
Company _____
Address _____
City/State/Zip _____
Telephone _____

- ☐ OS/VS TRAINING ☐ IMS TRAINING
☐ CICS TRAINING ☐ ENTRY LEVEL
☐ SYSTEMS TRAINING TRAINING
☐ USER TRAINING ☐ IN-HOUSE PRICE
INFORMATION

CW0982



A little Computer with Get Up and Go

It's easy to get carried away with Attache.™ After all, Attache is the first fully-featured computer that's as small as a briefcase, yet big enough to handle business planning spread sheets or resolve the toughest engineering equations.

At a mere 18 pounds and just a half cubic foot, Attache travels wherever business takes you:

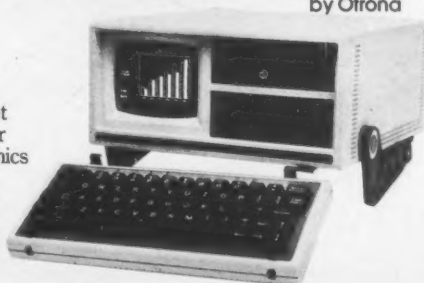
To the office.
The laboratory.
Into the field.
Then home.

Attache's integrated communications let you talk to a computer across the hall or around the world. High resolution graphics and Charton™ software help you create graphs and drawings for science or business.

Attache gives you WordStar® for creating professional reports; Basic-80® for programming; and CP/M® to give you access to thousands of pre-written application packages.

Attache™

by Otrona



Attache's unique, dual-processor design, 64K byte user memory and 720K diskette storage give it power to compute circles around most desktop systems. Unexcelled performance that fits under an airline seat, with room to spare.

Get up and go with Attache. Call Otrona for the dealer nearest you. Otrona Corp., 4755 Walnut Street, Boulder, CO 80301.

(800) 525-7550

8:00 A.M. to 6:00 P.M. MDT

In Colorado, Alaska, or Hawaii, call (303) 444-8100.

Attache and Charton are trademarks of Otrona Corp. WordStar is a registered trademark of MicroPro International Corporation, Inc. CP/M is a registered trademark of Digital Research, Inc. Basic-80 is a registered trademark of Microsoft, Inc.

FLOW Calc™

the VAX spreadsheet calculator

\$3500

to try it yourself, call:

800-235-6788 (in California, call 805/964-7724 collect)

The Software Workshop™

GENERAL RESEARCH CORPORATION • A Flow General Company
5383 Hollister Avenue • Santa Barbara, California 93111

Laboratories' Decision to Try Unproven Package Pays Off

CLARKSBURG, Md. — The decision to try a relatively unproven system software product from a new vendor has paid off for Communications Satellite Corp. (Comsat) laboratories here.

Having made the commitment to IBM's VM environment on an IBM 3032 in 1979, Comsat had been using IBM's Dasd Dump/Restore (DDR) program to accomplish disk-to-tape backup of its VM files. Backing up its disk on tape was critical to the supplier of satellite communications services in case a disk failed or a user inadvertently deleted a file, according to Samuel Wax, the manager of systems implementation in Comsat's

computer center.

While DDR worked adequately, Comsat said it had disadvantages. For example, the software would dump only entire disk packs to tape, requiring the company to dump its entire system to tape each night. In addition, DDR only permitted the use of one tape drive at a time. Meanwhile, Comsat's VM system held 1100 minidisks, containing 48,000 individual CMS files on-line.

Another problem with DDR was that it could not directly restore an individual file. In the Comsat environment, this restriction was considered a major disadvantage.

Wax said the need to serve Comsat users better provided the impetus to solve its problems. So about a year ago, Comsat decided to become one of the first users of VMBackup from VM Software, Inc. of Falls Church, Va.

"To the best of our knowledge nobody else sold a product to meet our needs," Wax maintained, and added, "We're quite satisfied with it."

VMBackup reportedly uses multiple tape streams that cut down substantially on time required for backup. It also features incremental dump capability, so only user files that have been changed are backed up, rather than taking the time and tape to back up an entire disk pack. This conserves machine time and tape, while simplifying tape-to-disk restore processes if a file is accidentally destroyed, Wax explained.

Comsat system programmer Thomas Kern concurred, citing both time and cost savings: "With IBM's DDR, we were spending 15 hours of elapsed time and using 138 tapes on weekly dumps. With VMBackup, we are spending only 1½ hours a week on full pack backups and using only 9 tapes. We also use a daily incremental backup, requiring less than one reel of tape and about 30 minutes of clock time with VMBackup."

"And we're serving our users better than before — that's the point. VMBackup can do backup and/or restore at any time during the day or night without impacting our users."

DPMA to Conduct Software Seminar

LOS ANGELES — The Data Processing Management Association's (DPMA) Education Foundation will conduct a two-day seminar on software quality assurance, data verification and validation. The seminar is slated to take place in San Antonio, Texas, Nov. 1-2; Boston, Nov. 4-5; and Washington, D.C., Nov. 15-16.

The program will be presented by Raymond Rubey, technical director of Softech, Inc. Rubey will focus on problems facing software managers and will suggest some solutions to effect quality assurance, verification and validation.

Registration costs \$425 for DPMA members and \$445 for nonmembers. Group discounts are also available. Further details can be obtained from DPMA Seminars, P.O. Box 91295, Department SQA, Los Angeles, Calif. 90009.

How to get more out of CICS and IMS.

For over 13 years, On-Line Software International has been dedicated to increasing CICS and IMS productivity as well as extending basic system capabilities. We offer a total range of products and services, all supported by a staff of skilled professionals. Call toll free 800-526-0272 for more information. (In New Jersey, call 201-488-7770.) Discover how easy it is to reach your data processing and telecommunications goals.

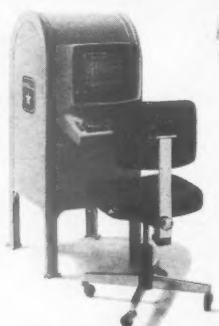
CONSULTING: Our services include EDP planning, capacity analysis and planning, data-base and distributed system technologies, and systems migration management, as well as technical support.

EDUCATION: Our CICS and IMS seminars, offered throughout the U.S., get consistently high marks. So do our valuable handbooks on the subjects.



GUARDIAN

The effective, flexible CICS security software that counters the growing menace of computer crime.



OMNICOM

Electronic mail software that turns your CICS network into a mail carrier without adding hardware.



INTERTEST

The interactive testing and debugging software that lets you fly through CICS testing without crashing.



STANDARDS SERVICE

Our Standards and Guidelines Development Service saves you time, money and confusion in operating your CICS or IMS installation.



DATAVANTAGE

The software that simplifies IMS application development and testing, while giving you greater data base control.



INSYST

The instant system generator that creates CICS programs in 20 minutes. Helps eliminate ad hoc programming backlogs.

ON-LINE SOFTWARE
INTERNATIONAL

See us at
SOFTWARE EXPO, Booth #1051

Fort Lee Executive Park, Two Executive Drive, Fort Lee, NJ 07024 • (201) 592-0009 • Toll Free (800) 526-0272

How to take the strain off your mainframe with Electronic Filing from Kodak.

Storing original-document information in the Kodak IMT-150 microimage terminal can take the strain off your computer. Here's how.

The IMT microimage terminal has its own intelligence—a built-in microprocessor that tells it exactly where to find the document you need.

Once your computer off-loads the on-line index information to the IMT terminal, the terminal takes over. Your mainframe can go back to doing what it does best—manipulating data, not searching for it.

The IMT terminal is so fast that it performs these on-line lookups in seconds. At the push of a button. And it can produce dry, ready-to-use paper prints in seconds, too.

Want to make life easier for your filing staff as well? The IMT terminal is so fast and easy to use that it lets your workers perform more lookups. And it locates images so precisely that it almost does away with annoying lookup errors.

Take the strain off your computer and your staff with the Kodak IMT-150 terminal. It will take the strain off you, too.



Eastman Kodak Company
Business Systems Markets Division
Dept. DP2606
Rochester, NY 14650

- ☐ Please send me more information about the Kodak IMT-150 microimage terminal.
- ☐ Please have a Kodak representative contact me.

Name _____ Title _____
Company _____
Address _____
City _____ State _____
Zip _____ Phone _____



Now you don't have to decide between a personal computer and a VT100 terminal.



Digital's introduced a personal computing option which can turn a VT100 terminal into a personal computer that uses the CP/M® operating system.

It's called Digital's Personal Computing Option. You can purchase just the option, or you can buy the complete terminal/computing package called the VT180.

Either represents significant advantages over the choices available to you now. For now, you can provide access to a large computer and personal computing at the same terminal.

More than that, you save the additional cost of putting personal computers and terminals side by side on the top of a desk.

With the CP/M operating system Digital's personal computing terminal will run the literally hundreds of programs available for it. Including word processing, mailing lists, financial modeling, statistics, even data base

communications—in addition to the many more being specially edited for this terminal.

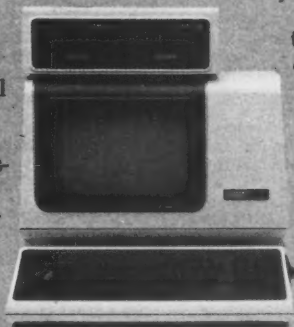
And by virtue of the fact that Digital's personal computing terminal is VT100-based, you get all the features that people buy VT100s for in the first place. Features like smooth scrolling with up to 132 columns display, split-screen viewing, double-height and width characters, and reverse video.

Plus a reputation that's second to none in the industry. Plus Digital's service, on-site, anywhere in the world.

All of this should make great sense to the DP manager confronted with the choice of terminals or personal computers.

Because now you can pick one and get both.

See your Digital distributor today or call 1-800-DIGITAL, extension 700. In Canada, call 1-800-267-5250. Or write: Digital Equipment Corporation, Terminals Product Group, 2 Mt. Royal Avenue, UP1-5, Marlboro, MA 01752.



digital

T/S Helps Multinationals Track Subsidiaries

SEATTLE — Keeping up-to-date records of what foreign subsidiaries are doing can often be a hassle for DPs in multinational corporations and a handicap to executives doing strategic planning. But at least two multinational corporations have found time-sharing to be a solution to those problems.

Schoenfeld Industries, Inc., an apparel manufacturer here, is using time-sharing services provided through Control Data Corp.'s Service Bureau Co.

According to Schoenfeld's assistant controller, Judy Van Noy, the firm has multiple international reporting stations hooked into the time-sharing system that was installed in May 1980.

The foreign subsidiaries prepare financial information on foreign currencies, which is consolidated at corporate headquarters here. The system is programmed to make conversions into U.S. dollars, and the figures are then consolidated for management reports.

"In the past, we would make the conversions over a two-week period. Now we get the conversions in about five minutes and there is almost no chance of error," Van Noy said.

'What-If' Analysis

In addition to making currency conversions, the system is used to perform various types of financial modeling and "what-if" analysis.

That information, as well as data collected from around the world, can be presented to Schoenfeld managers via the system's graphics capabilities, which can produce graphics and print them on transparencies for board meetings, Van Noy said.

The heart of the time-sharing package is CDC's Proplit II data management and reporting language to communicate with the foreign subsidiaries.

Van Noy said Schoenfeld chose that package because it was fairly easy to use and allowed solutions to be implemented quickly.

Another multinational firm, Beatrice Foods Co. in Chicago, is also

using CDC's service bureau. The firm has about 100 different international profit centers, which have been operational since 1978.

"Periodically, we evaluate alternatives to the system. We've looked at hardware companies, but time-sharing always wins out as the best method available for what we have to accomplish," according to systems analyst Dennis P. Jones.

Since installing the system, "we've been able to change our focus from merely tracking historical performance.

"One of the principle uses for this system is to aid us in planning and forecasting," Jones said.

Before time-sharing, Beatrice started each June to prepare documents

for budget presentations for the rest of the year. "That would compromise the accuracy of the plan because we didn't have all the facts we would have later in the year. Now, we can establish the same plan in August or September. This gives the time to determine what the impact from various factors will be on operations," Jones said.

In addition, the time-sharing system allows the food company to evaluate the performance of its foreign subsidiaries.

Things like operating groups, business lines and country-by-country evaluations can be processed, Jones said.

"We do business in 26 different currencies. By putting the system to

work, we have a much better way to determine exchange rates. A foreign subsidiary may be showing strong earnings in its own country, but those profits are going to evaporate if the local currency is weak.

"Situations like this naturally have to figure into our overall planning," Jones said.

Like Schoenfeld Industries, Beatrice Foods uses a CDC graphics package to create a monthly financial summary for management. "The graphics have become quite popular since we began using them [in 1979] to highlight trends and compare the financial performances of the different geographic areas," according to John P. Deckro, controller for Beatrice's International Division.

"Lanier, will you guarantee to help my system pay off tomorrow as well as today?"

With every Lanier electronic office system you get something extra: the Lanier Support Program. The first program of its kind to be defined in writing. It promises that we'll not only show you how to use your equipment, but how to use it to its maximum. And we'll continue to do that, as new state of the art applications are developed.

"How does the Lanier Support Program work?"

"Our Initial Support Guarantee states that we'll assist your staff for the first 90 days following installation. In two areas: training and application development. Training to help you use the Lanier equipment efficiently. Application development to help you streamline your current applications and develop custom applications."

"What kind of training will you give my operators?"

"Complete and thorough. Our training includes classroom as well as 'hands-on' instruction. We teach your operators how to work with the equipment, software and accessories that comprise your Lanier system. Or we will teach your people to do their own in-house training. Your Marketing Support Representative then visits your site regularly to provide additional training."

"What happens after the Initial Support Guarantee is up?"

"We offer an Extended Support Guarantee. A guarantee

renewable on a yearly basis. This contract includes four visits each year from your Marketing Support Representative to ensure you're getting the most from your Lanier system."

"Who is this Marketing Support Representative?"

"Your personal Lanier specialist. Each MSR is specially trained to meet the needs of all companies—even those with multiple locations. MSR's are assigned to your account even before your Lanier system is installed. They provide training. They help you develop and implement applications. They even follow up to make sure there are no problems. A valuable resource."

"How do you keep our applications up-to-date?"

"With 'The Update' Package. This special package shows you the most recent applications, developed by Lanier MSR's or contributed by our customers."

ISI Users Meet Set for Oct. 1

DENVER — Innovative Systems, Inc. (ISI) will conduct its annual Users Conference here Oct. 1.

ISI specializes in software and consulting services for central information-file conversion and maintenance and marketing for financial clients and industrial organizations.

The theme of this year's meeting will be ways to transform a central information file into a more versatile data base for marketing and strategic planning purposes, according to an ISI spokesman.

In addition to the marketing data base discussions, present and future enhancements to all ISI systems will be outlined, and users will have the opportunity to suggest further enhancements.

Additional details on the upcoming event can be obtained from Kenneth Benvenuto at ISI, 341 Fourth Ave., Pittsburgh, Pa. 15222.

Mini Handles All the 'Trimmings'

Auto Decorator Logs On to Hold Profit Line

HOLT, Mich. — Maintaining profits while staying competitive is a critical objective of many companies in today's economic environment. Fortunately, computers are at the forefront of this battle against the inflationary bulge.

At Spartan Plastics, Inc., for instance, an NCR Corp. minicomputer is used to achieve faster customer service, better inventory control and a more efficient manufacturing operation.

Recently, the computer has been augmented by the addition of a bill-of-material module that provides a central control point for keeping accurate and up-to-date product struc-

ture and cost data, making it possible to maintain and retrieve manufacturing and cost information on an entire product line, according to Chuck Krauss, president of the firm based here.

Spartan is reportedly a leader in the production of self-adhesive, decorative trim products for the automotive aftermarket. It also manufactures trim products for boats and product identification labels and fleet markings for industrial applications. The company employs 125 people and has annual sales of \$14 million, Krauss said. The company receives about 100 orders per day, each one requesting as few as two or as many as 500 items.

as 500 items.

When the firm opened for business 22 years ago, office operations were handled manually. Later, a book-keeping machine was installed to mechanize the accounting. But order processing continued to be handled manually because the company was small enough that employees knew every customer, order and product.

As business grew, the firm decided to install a minicomputer. It initially installed an NCR 8200 system, but gradually it evolved to a more powerful NCR 8410, which is what it uses today.

The minicomputer presently has 512K bytes of memory, four NCR

6590 disk units for a total storage capacity of 200M bytes, a 300 line/min. printer and seven CRT terminals.

On the 8410, the firm has implemented the bill-of-material module offered with NCR's Interactive Manufacturing Control System II. The module's data base maintains both standard and current costs for material, labor and overhead amounts by item. Data is entered through a CRT terminal.

Because of the module's data base structure, any changes made to an item in the file are reflected throughout the entire product structure master file, updating all bill-of-material costs, Krauss explained. The module's data base also makes it possible to automatically roll current costs to standard costs to establish new standards and allows rapid retrieval of detailed information.

"Previously, we had costing information, but it was produced manually only once a year," Krauss stated. "Now, we enter cost increases as they occur, automatically updating all bills of material whose costs are affected."

To boost inventory control, the firm developed a finished products inventory file that is now part of the bill-of-material module. The products file maintains a perpetual inventory, which is checked daily for accuracy, and frequent sample inventories that are conducted throughout the year.

The module can also produce labor distribution reports for capacity planning purposes, a weekly report comparing standard labor hours to actual labor hours and a material requirements report for planning component parts and raw materials.

Sales reports are also produced on the system by product, customer and each of the firm's 50 sales representatives. Presently, the system maintains accounts receivable for 4,000 Spartan customers.

"In writing."

Deby Fain, National Market Support Manager,
Electronic Office Systems Division

The Update' also includes other materials—product announcements, system housekeeping advice and information on upcoming seminars in your area."

"How do you keep our operators up-to-date?"

"With Advanced Operator Seminars. These are held throughout the year to promote increased production, give instruction and discuss new ideas. Lanier also offers Customer Update Seminars. These workshops will inform you and your staff of the latest software product developments."

Lanier is known for being the most "customer-concerned" in the business. That's because we stay with you. Through installation, through training, through new applications, through more training. For years to come. Anywhere in the world.

Send us this coupon, or call Jennifer Scott at (800) 241-1706 for more information about Lanier's electronic office systems. Except in Alaska or Hawaii. In Georgia, call collect: (404) 321-1244.

Send to:
Lanier Business Products, Inc.
1700 Chantilly Drive N.E.
Atlanta, GA 30324
Attn: Jennifer Scott

Name _____
Title _____
Phone _____ Best time to call _____
Firm _____
Address _____
County _____
City _____ State _____ Zip _____

Sept. 13 '82 Computerworld 4A3H2

*We'll change your mind about the future
Right here and now*

LANIER®

Course Offered For RPG-III

WOODLAND HILLS, Calif. — A computer-assisted course for IBM System/38 RPG-III programmers is available from Automated Training Systems.

The course reportedly allows programmers familiar with RPG-II to take full advantage of the new features available with RPG-III. It covers the RPG-III life cycle, externally described data base files, file operations, structured programming op-codes and constructs, debugging facilities and several additional op-codes. It also covers the mechanics of creating programs and files for the System/38.

Included are 10 audio-cassette tapes, three illustrated study guides and workbooks, a diskette with several source programs and the test files that are needed to execute them and which can be accessed and modified by the student.

The course costs \$695 from Automated Training Systems at 21250 California St., Woodland Hills, Calif. 91367.

We're talking BASIC here.

BASIC convenience—each of our 3 Sheraton-Tara Hotels is handy to the computer/electronic complexes along Routes 128 and 495. And easily accessible to Boston and Logan Airport. Each features classic Tara Elegance—oversized guest rooms, superb dining, inviting lounges and nightly entertainment. Full health club facilities. And excellent facilities and service for meetings of all sizes. Making your business travels a pleasure... basically, that's what we're all about.

Sheraton-Tara Hotels

THE FLATLEY COMPANY

BRAINTREE, MASS. (617) 848-0600
Route 128 at Exit 68

FRAMINGHAM, MASS. (617) 879-7200
Mass. Pike at Exit 12, Rte. 9 West

NASHUA, N.H. (603) 888-9970
Route 3 to Exit 1 to Tara Blvd.

OR CALL OUR
TOLL-FREE NUMBER:
800-325-3535



THE BEST ADD-ONS TO YOUR TIMEX-SINCLAIR 1000

SYNTAX and SQ

SYNTAX newsletter brings you news, reviews, and applications, plus technical notes for circuit-builders. Enough to keep you busy month after month. Through SYNTAX you can communicate with thousands of Sinclair and Timex users to share problems and advice about programs and vendors. You get timely updates about new hardware, software and publications. And we cover all the Timex-Sinclair computers, including ZX80/MicroAces, as well as ZX81s and the new Timex-Sinclair 1000s. When Sinclair's new Spectrum reaches the US, you'll find Spectrum programs and applications in SYNTAX. Even our ads keep you up to date on the ZX/Timex world.

SYNTAX emphasizes practicality. You can use our programs and projects even if you aren't sure at first why they work, because you get complete directions. Text is clear and easy to understand. SYNTAX readers already know about:

- Adding a Joystick (6/82)
- Adding Big Keyboard (12/80)
- QS Hi-Res Graphics (4/82)
- Making a Phone Dialer (2/81)
- FORTH on ZX/TS (5/82)
- 8K Income Tax Program (6/82)
- Building Additional RAM (3/81, 2/82)
- Alphnumeric Sorts (10/81)

And SYNTAX readers respond to what they get every month:



Thank you for supplying back issues of SYNTAX... After looking them over I am convinced that your publication offers superior information on the ZX81 microcomputer.

Steve Simic
Cleveland Institute of Electronics

I'm really pleased with SYNTAX — both content and service. It's the best (and only reliable) support in N. America for ZX enthusiasts...

Bob Partridge
Pickering, Ontario

AN UNCONDITIONAL

GUARANTEE: We are so sure you'll find SYNTAX and SQ useful that we promise to refund your entire subscription fee if you aren't

satisfied. An unconditional guarantee — you can't lose, so choose your deal on the coupon below and return it to SYNTAX/SQ now.

Fill out the coupon below and mail it to: SYNTAX/SQ, RD2 Box 457, Harvard, MA 01451

☐ My check is enclosed. ☐ Please charge my ☐ VISA
Make checks payable to: ☐ Diner's Club ☐ American
SYNTAX ZX80, Inc. ☐ Express ☐ Mastercard
☐ Carte Blanche account.

Account number _____

Exp. date _____ Bank number (MC only) _____

Signature _____

Name _____

Address _____

City _____ State _____ Zip _____

Day phone () _____ Evening Phone () _____

YES! Please send me:

- ☐ The Combination (12 issues of SYNTAX and 5 issues of SQ) \$39
- ☐ The Catch-up (SYNTAX Jan. 82-Dec. 83, 5 issues of SQ, plus 1 binder) \$77
- ☐ The Works (SYNTAX Nov. 80-Nov. 83, SQ Nov. 82-Nov. 83, plus 2 binders, a 50% savings) \$97
- ☐ 12 issues of SYNTAX \$29
- ☐ 30% pre-pub savings on SQ's premier issue, (exp 10/31/82) \$3.50
- ☐ 1 Premier Issue of SQ \$4.95
- ☐ 1 Binder \$9 ☐ 1 issue of SYNTAX \$4

These offers expire 31 Dec. 82 — SUBSCRIBE NOW

Perfume Firm Sniffs Success With Expansion of System

PARIS — The sweet smell of success has always belonged to the exclusive Guerlain label of perfume, and computer technology is ensuring that optimum manufacturing and administrative methods keep it that way.

Over the last 10 years, sales at Guerlain have soared at the rate of about 15% per annum.

The firm recently updated its computer system to a Sperry Univac System 80 to expand its real-time facilities in light of the company's continued expansion.

The firm produces 12 major perfumes, each with its own packaging and marketing style, and a full range

of makeup and skin care products. A remarkable aspect of the perfume is that each scent can contain as many as 100 different ingredients.

Computer monitoring of how much of each ingredient is needed at any given time is absolutely necessary for the business to run smoothly.

The firm also employs 30 people to develop and test new materials and help synthesize new ingredients. The actual creation process is one of meticulous detail, and one new perfume can take as long as five years to develop.

Once a perfume, toilet water or cologne is made and packaged, it must go quickly to distributors and retailers. This is most important for cosmetics, and particularly skin care products, which need to be especially fresh to be most effective.

Every three weeks a different line of makeup is produced at the Chartres factory, and different perfumes are produced every two months at the Courbevoie factory. Because of systematic production control, ordering and dispatch procedures, Guerlain manages to get goods to their stock lists that are never more than two months old.

Routine Functions

As well as ensuring that manufacturing processes go smoothly, the computer takes care of all the routine administration and financial control functions relevant to any home and export company.

The four major areas of activity are: order/distribution management, for customer and suppliers; accounting, for production and general uses; personnel administration, including payroll; and manufacturing.

Guerlain's configuration includes one System 80 Model 5 with 768M bytes of main memory; 118M bytes of disk storage; one floppy disk unit; two magnetic tape units; two 640-line/min printers; six workstations; and five UTS 20 CRT terminals, plus copy printers.

The first step in getting the System 80 operational was the changeover of existing batch jobs to real-time systems. Soon the firm plans to automate the dispatch function.

In the future, Guerlain may also utilize Univac's Unis 80 software, comprising interactive modules that share data through a common data base.

Unis 80 modules include production, engineering, data management, product costing, customer order processing and purchase order control.

Other modules include inventory status and control, forecasting and analysis, master scheduling, material requirements planning, production planning and work order control.



'Dough Re Me Fa Sold La Tee Hee!'

The Information Center

Theirs:

**QBE, GIS,
STAIRS, APL,
ADRS, SQL,
Etc...**

Ours:

INQUIRE[®]

See us at Software Expo/Chicago Booth #357

Help users help themselves. That's the idea behind IBM's Information Center, where the data processing department will provide and maintain tools to allow users to retrieve, analyze, manipulate and present data (including textual material) more effectively.

They've got the right idea, but the wrong tools.

When productivity is all-important, why buy, learn, and support a hodgepodge of ever-changing systems in your Information Center?

With a single non-procedural language easily learned in a few hours, INQUIRE can boost user productivity, DP productivity, and support the entire decision-making process.

We've been helping companies establish information centers since 1968. Call us toll-free today to find out how.

INFORMATION CENTER SEMINAR

September 20, 1982 — Chicago
October 4, 1982 — Boston
October 5, 1982 — New York City
October 6, 1982 — Somerset, NJ
November 1, 1982 — Chicago

Infodata

Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, Virginia 22041
800-336-4939
In Virginia, call 703-578-3430
Offices in:
Dallas, Los Angeles, New York
Rochester, NY, St. Louis, Washington, DC

*INQUIRE is a registered trademark of Infodata Systems Inc.

©1981 Infodata Systems Inc.

Outside Contractors Offer More Than Experience

By Paul A. Martino
Special to CW

DP managers who during "peak-load" situations find themselves temporarily short of specific talent are adept at acquiring it on a temporary basis by contracting with an outside service.

Occasionally, though, the reasons for turning to an outside contractor are broader than the acquisition of specific skills. The DP manager may wish to supplement the experience of his staff with a temporary outside resource while a more permanent solution is pursued.

Experience is more difficult to acquire and use effectively than programming and analysis skills, and

maximizing the benefit for the dollar spent in the purchase of experience can be considerably more elusive.

Collection of Skills

Experience might be best thought of as a collection of skills in a wide variety of areas. These might range from such things as techniques not covered by the Cobol manual to the ability to write memos, conduct meetings and interview users. From this point of view, experience can be valuable in several ways.

The first is feedback, although it is also the most difficult to take advantage of. There is a normal procedure whereby the policies and activities of a department are continually re-

viewed and fine-tuned. The results of various activities and performance are weighed by management and required enhancements or modifications are made. An experienced external perspective could be of use in making these observations.

The outside observer's determination of where a change of emphasis is needed or where a modification of procedures is required or where a specific skill is called for can be of particular benefit. An appropriate feedback mechanism that places these views before management can produce positive results. This approach has an inherent danger: Staff may see it as a threat intended to criticize them. Management must be es-

pecially sensitive to this possibility and monitor these activities with care.

Formal training is a direct way to take advantage of experience. The experienced person can conduct a formal class in the skills which will benefit the department. This type of training lends itself to the full range of technical topics and to project methodologies.

Formal Training

The DP manager should also consider formal training in such things as oral and written communications, the art of conducting meetings and other people-related skills. There are, however, limits to how much formal training an organization can absorb or endure.

One of the more valuable ways experience can assist an organization is through day-to-day training or coaching. This technique can impart knowledge of many different skills in a very effective manner. It has the advantage of transferring knowledge at the most appropriate time — when it is needed. Properly approached, coaching can produce significant results with a minimal disruption and is equally applicable to both technical and nontechnical skills.

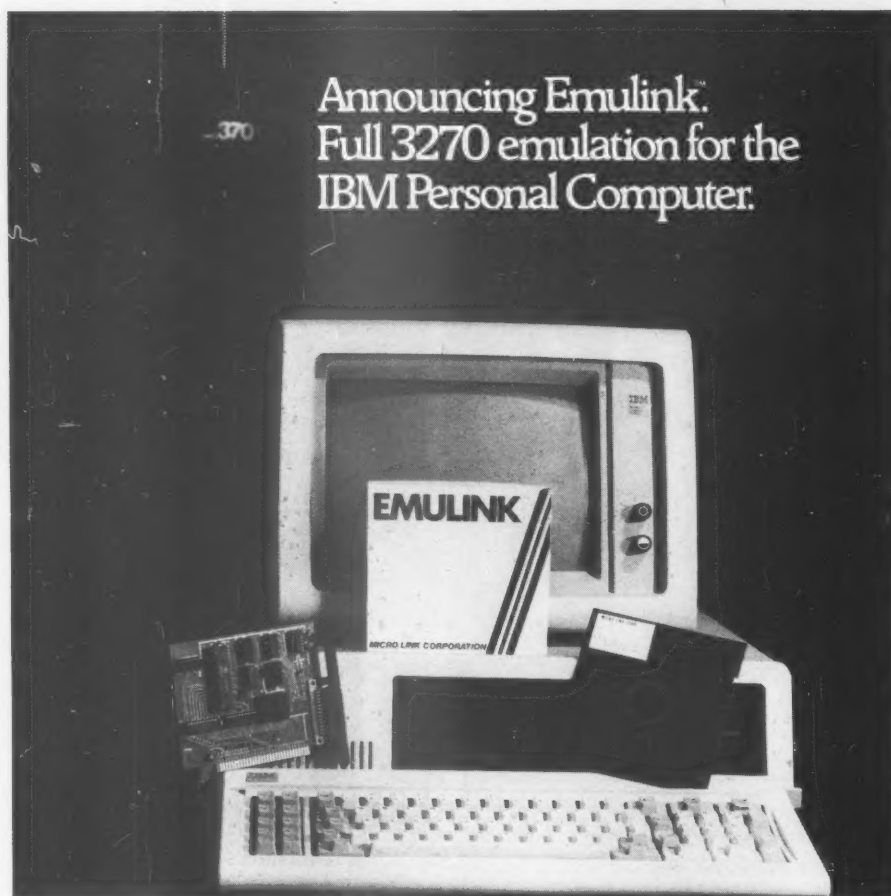
Two important prerequisites must be established if any of these areas are to be successful. The first is an explicit definition of what goals are to be attained. Success models for performing this type of activity are uncommon when compared to familiar areas like programming or analysis. It is subsequently all the more important that a clear statement of what is expected and what can be accomplished is produced. If care is not taken to explicitly state specific goals, the danger of disappointment on the part of management and frustration on the part of contracting personnel is very great.

The second prerequisite is legitimacy. All of the activities noted above usually proceed from a higher point in the organization to a lower one. Thus the most junior members of an organization are the recipients of training, not the originators of it. This level of employee generally looks to management for guidance on appropriate training.

It is important that any activity in these areas be viewed by the rest of the organization as having the blessing and approval of management. This does not mean that a contractor must be put in a position of high authority, or that new positions must be created, or that organizational charts must be changed. It does mean that the organization must be aware of management's goals and the course management has set for their attainment.

The strategy discussed here has the objective of acquiring and retaining knowledge in the host department. The most benefit will be attained when as much knowledge as possible is transferred from the contracting personnel to department staff. This will lead to a continuing benefit from the dollar spent on the particular assignment.

Martino is vice-president of Kieffer, Martino and Associates, Inc., Cheektowaga, N.Y.



Now you can link your IBM/PC to the IBM® host and communicate exactly as you would with a 3270 terminal—but with added features. Emulink™ includes: Operation from 1200 to 9600 baud, 24 PF keys, 3 PA keys, bisync multipoint polled protocol, full bisync error checking, EBCDIC character coding, user programmable function keys,

save screen information to diskette, and more!

Emulink™ operates with any IBM 360, 370, 303X, 308X, 4300 or any other IBM 3270 compatible mainframe. Emulink™ supports most systems including JCCF, TSO, VM, CICS, IMS, VTAM, BTAM, TCAM.

Emulink™ package comes with hardware, software and complete documentation.

AVAILABLE TODAY!

Emulink™ is shipping from stock.



A Product of Micro Link Corporation
P.O. Box 113 Long Lake, MN 55356
(612) 476-1300

FOR MORE INFORMATION CALL TOLL-FREE

1-800-328-2260

IN MINNESOTA, CALL (612) 544-3615

Available only through

DATA SOURCE
systems Corp.

Your Source For Micro Software and Hardware

DataSource Systems Corporation—Dept. KB—1660 South Highway 100—Minneapolis, MN 55416

IBM is a registered trademark of International Business Machines.

© 1982 DataSource Systems

CP/M® & IBM.

It's hard to imagine one without the other.

If you're thinking about buying an IBM Displaywriter, or if you already have one, you need to know about CP/M-86™ from Digital Research. CP/M-86 is the most versatile operating system in the 16-bit microcomputer world, giving you access to hundreds of applications programs. CP/M-86 along with an application program turns your Displaywriter into

a financial advisor, budgeting expert, appointment scheduler, client accountant, or inventory manager, as well as a superb word processor. Call or write Digital Research and ask about CP/M-86 for your Displaywriter. You'll learn why it's the first choice in 16-bit operating systems. 160 Central Avenue, Pacific Grove, California 93950. (408) 649-3896.



DIGITAL RESEARCH™

CP/M is a registered trademark of Digital Research Inc.
CP/M-86 and the Digital Research logo are trademarks
of Digital Research Inc.
© Copyright 1985, Digital Research Inc.



College's Engineers Line Up To Get Graphics Capability

WEST LAFAYETTE, Ind. — Professors of Purdue University's 12 schools of engineering were lining up for the chance to get their calculations into graphics form. The line formed at the hard-copy printer.

Although Purdue had the computing power of six Digital Equipment Corp. VAX-11 computers and two PDP-11/70's running Bell Laboratories, Inc.'s Unix operating system, users who wanted graphics displays of their data still had to leave their offices and find an unused hard-copy device.

Many of the professors would have preferred to have graphics displayed on their own dumb terminals, and more and more of them have found research funds to upgrade the terminals with a graphics enhancement card.

About a year ago, Purdue began upgrading its Lear Siegler, Inc. ADM-3A terminals with Digital-Engineering, Inc. Model RG512 Retro-Graphics terminal enhancements, a company spokesman said. The school began with three boards and has been adding boards regularly ever since. Purdue now has 10, with more to come.

Move Popular With Faculty

The move has been very popular with the faculty, according to the school of electrical engineering's hardware designer Peter Hallenbeck. "Rather than leave their office, find a printer, wait for hard-copy generation and go back to the office to study the result, they simply put the picture on the screen in front of them," Hallenbeck said.

The users do not need to learn graphics programming. Purdue has designed its own "Quickplot" program that turns data values into positions on a bit map of the screen. The user runs an application program on data files; the application program produces files of vectors and Quickplot puts the results on the screen.

"It's not as complicated as it may sound," Hallenbeck said, because the Unix operating system has 'shell' files, or macros, that call several files in sequence. A simple command to the system will compile the program, run it with the data specified, bring up the Quickplot and display results.

The user can take any degree of control over what the graph looks like. "Most graphics packages have enough options to drive us mad," Hallenbeck said.

The normal process is to go with the default values for rough drafts, then dress up the final results with labels, log axes and data point values for final presentation, a Digital Engineering spokesman said.

The Digital Engineering boards are compatible with a Tektronix Inc. 4010 graphics terminal, so the faculty can use Purdue's high-resolution graphics terminals and printers for final display, the spokesman said.

Hallenbeck, who is part of the team that maintains computer equipment at Purdue, was familiar with enhancement boards and had designed a similar board for one Purdue terminal. "We didn't think it would be too much trouble to design a box that

would sit on your terminal and watch the characters go by, and when it saw a 4010 graphics word, would interpret it and start plotting," Hallenbeck said.

"Our problem was that every time we found a terminal clever enough to upgrade to graphics, the terminal alone costs \$2,000 to \$4,000. We would have had to pay for a lot of modularity, a fully configured terminal with a backplane and interface logic cards. All we wanted was graphics."

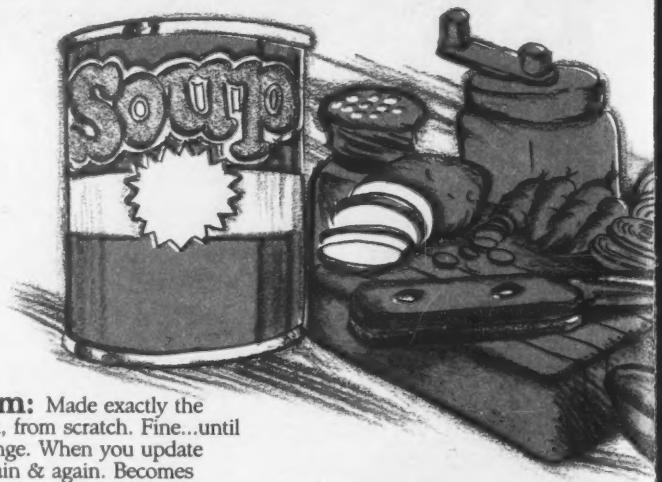
Purdue considered designing its own terminal, but eventually came back to the ADM-3A because of its low price.



Purdue's Prof. Peter Hallenbeck translates calculations into graphics form.

1. Canned:

Limited selection. Rigid. You adapt to it. Eventually, all the concessions you make to it outweigh the advantages of a canned product. Then you can it.



2. Custom:

Made exactly the way you want it, from scratch. Fine...until your needs change. When you update it, you pay. Again & again. Becomes very expensive.

What's Soup Computer

Explaining The Facts Of Life About Human Resources Software.

If you're considering buying an applications software package, the biggest problem you're going to have is evaluating everybody's bells and whistles and promises. They're all mostly the same and not the most important consideration anyway.

What is important is the type of software. There are only three kinds of packages available: Canned, Custom or Generated. Just think of each as the type of soup you'd like to have every day for the next 10 or 20 years and your decision will be easy. Generated software. From Genesys.

PAYROLL ACCOUNTING PERSONNEL ADMINISTRATION BENEFITS MANAGEMENT

Genesys custom-generated software packages are available singularly or integrated into one comprehensive Human Resources Management System that is the total solution to all your needs. Guaranteed compliance with all U.S. and Canadian legislation. Immediate response to all information requests. Automatically forwards entered data across referenced data bases. Complete security. Includes IRAs, group legal insurance, electronic funds transfer, career pathing, actuarial data processing, formattable check statements, and all your other requirements.

Because it's generated, Genesys Human Resources Management software is also the easiest to use.

Faster Turnaround Time

Tax Service Bureau Gets Returns With System

LOS ANGELES — Signifying the end of the tax season, a big party was held for 32 permanent and 238 temporary employees of Computer Sciences Corp.'s (CSC) Tacs office, a data processing service here that specializes in fast turnaround of income tax returns for accountants and tax preparers in 12 western states.

Not surprisingly, it was the night of April 15, 1982 — and there was plenty to celebrate. Since Jan. 4, when the first batch of 250 tax returns was fed through a Magnuson Computer Systems, Inc. M80 mainframe and then printed out on three Xerox Corp. 9700 electronic printing systems, Tacs had finished a record 600,000 re-

turns. The service had turned each return around from input data to delivery within an average 48-hour period. A single-day high of almost 12,000 returns was reached on April 9, a company spokesman said.

The computerized tax preparation industry, which nationwide accounts for a mere seven million of the 100 million income tax returns filed annually, flourishes in California. But for some unknown reason, Tacs DP Manager Robert L. Slattery reported, "accounts in other parts of the country don't use computers nearly as much."

Tacs has grown at a 30% to 40% annual rate since its launching in 1968,

a spokesman said. CSC acquired Tacs in December 1979 from Intel Corp.

Adding Features

Slattery, who joined the firm in 1974, has helped it mushroom in eight years from an output of 150,000 returns to this year's record total approaching 600,000. "Our revenue has grown in part because we're producing more complex returns today. We keep adding new features every year — more computerized input forms as well as schedules that diagnose various combinations of tax law regulations," he said.

Another key to Tacs' growth was the advent of Xerox laser-based elec-

tronic printing systems, which print both forms and variable data automatically and simultaneously at up to 120 page/min on standard 8½-in. by 11-in. paper, according to Slattery. "We were handling things in a very archaic manner before the Xerox 9700 trying to put together our hundreds of forms," Slattery noted. "The 9700 is one of the most technologically fantastic machines around, especially for our industry." During tax season, Tacs turns out about 1.5 million pages per month on each of its three 9700 systems, he said.

The typical federal income tax return requires 35 to 40 different forms — not to mention the numerous state forms. Tacs spent \$250,000 per year for continuous forms in the years before it acquired its first 9700 for the 1979 tax season. "We no longer have the expense of continuous forms," Slattery added, "and we save a substantial amount on labor costs during tax season."

Tax season for Tacs begins around Labor Day when the Internal Revenue Service releases its preliminary form changes for the upcoming tax year. Of the 500 or so different forms programmed by Slattery and his staff of five programmers (totaling some 600,000 lines of software code) between 350 and 400 forms are changed significantly every year because of tax law revisions.

This programming effort continues until December when the firm sends its 3,500 active accounts input data sheets for every return processed the previous tax season. Coded and preprinted with the client's name and address, these blank data sheets, filled in by the tax preparer, begin arriving in modest numbers around the first of the year at Tacs' headquarters.

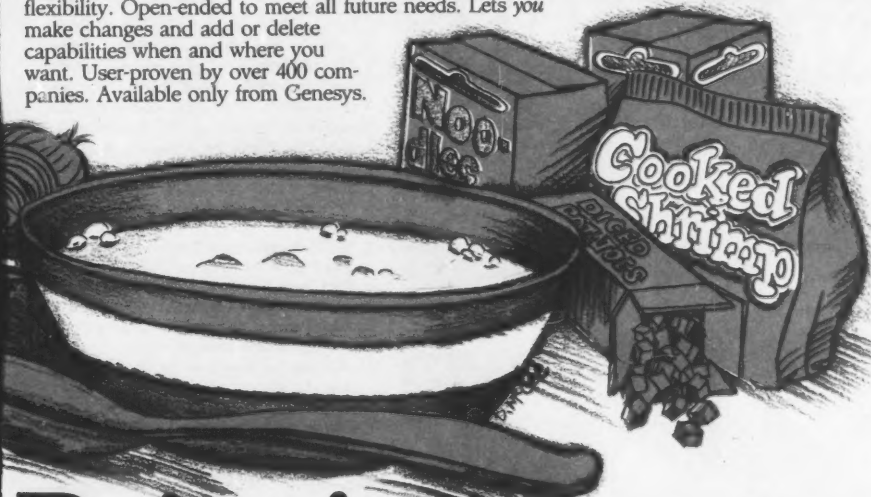
Two-Day Turnaround

And thus starts the 48-hour turnaround cycle in the life of a computerized tax return. Logged and batched into stacks of approximately 800 returns, the data sheets are reviewed by checkers for entry errors or missing data. Next stop is data entry, a large room manned by 64 key station operators hired as temporary employees during tax season to work two shifts per day, six and a half days per week until the final push in April, a spokesman said.

A packet of 15 returns takes about 25 to 30 minutes to key and verify. The operators key only the coded number on the preprinted data sheet, instead of the client's name and address, and the Magnuson M80 later addresses the code and automatically recalls the previous year's personal and tax data, including income averaging and other necessary computations.

After the data is keyed in and transferred to magnetic tape, the tapes are entered into the M80 with its 2M bytes of core memory, 800M bytes of on-line disk storage and 11 tape drives. The computer recalls and sequences the data and before any further calculations, does a tax-law-oriented edit that generates diagnostic messages identifying illogical, inconsistent or erroneous entries.

3. Generated: From fully developed code modules, is generated exactly to your toughest requirements. Unmatched capability, versatility and flexibility. Open-ended to meet all future needs. Lets you make changes and add or delete capabilities when and where you want. User-proven by over 400 companies. Available only from Genesys.



Doing in a Magazine?

Enjoy direct, on-line access for data entry and retrieval with All-Screen™, Genesys' user-friendly, interactive terminal system with unlimited screen building capability. It's the only system which will support multiple programs and automatically integrate all employee data.

Genesys is also the only company that doesn't make you handle vendor updates and releases. With a single telephone call,

our GENAIDS™ updating service immediately transmits all updates and releases directly from our computer to yours.

The facts of life are simple. Generated software has more capability, versatility and flexibility and is easiest to use. And it's available only from Genesys.

If your company has over 400 employees and you want Human Resources Management software you buy only once, give us a call.

Genesys, 10 Grafton St., Lawrence, MA 01843 AW-2
Please send me your brochure on these Genesys packages:
☐ Payroll ☐ Personnel ☐ Benefits Management

Name _____ Title _____
Company _____ Telephone _____
Street _____
City _____ State _____ Zip _____
Hardware _____



Genesys
10 Grafton St.,
Lawrence, MA 01843
(617) 685-5400

Benefits of Using Consultants Can Be Increased

By Steven J. Blackmore

Special to CW

Companies using data base/data communications software packages have, over the years, used a wide variety of techniques to select their consultants. The benefits these companies derived from using consultants have been largely determined by the comprehensiveness of the selection process.

The following guidelines can be used by companies selecting their first consultant, by those that have experienced difficulties in the past or by those looking to improve their current selection process:

- *Know what you want.* The most critical part of the consultant selection process does not involve the consult-

ing firm. It involves you. You must define in advance what it is you want the consultant to do, what type of skills and experiences the consultant should have and when and for how long you will need the services.

The more detail you have available, the easier it will be for the consulting firm to match their personnel to your job requirements. It will also be easier to evaluate performance during the duration of the contract.

- *Go to a number of consulting firms.* Unless you have unique requirements that only one firm can provide, you should submit a request for personnel to a number of different vendors (usually three to five). You should define the type of work, the estimated duration of the assign-

ment, the skills required and when you need to have their personnel available.

The information should be provided to the consulting firms in writing or during a personal meeting with a marketing representative. Avoid the telephone as much as possible, because there is a much greater chance of misunderstanding.

From the consulting firm's perspective, the more information you provide, the better the response they will be able to provide. It is important that you give sufficient lead time so that the consulting firms can schedule the availability of the appropriate personnel.

The selection of a list of vendors can be difficult, especially if you

have not used outside services in the past. One successful method is to contact other companies and ask whom they have used.

References play a very important role in the consulting business. Always check the references provided. They will give you a clear picture of the consulting firm's capabilities.

Another Method

Another method is to build a file that is organized by types of services provided. If you need specialized skills such as IMS, CICS, integrated data management systems and so on, go to firms that specialize in providing the types of services you need. These firms have people who are experts.

If there is a need for more general services, go to firms that provide a broader range of services. In either case, by using this approach you will get a better match between your requirements and the consulting personnel.

- *Request resumes.* Always request that the selected consulting firms provide resumes of the personnel being proposed. These should not be representative people who could be available, but actual resumes of people who would be available to perform the assignments. You must make certain that the individuals have the required skills and experiences.

- *Interview the potential consultants.* A company should never bring consultants into the firm without a technical interview to ensure that the individual meets the standards required to perform the assignment.

Do not be afraid to be tough; most consultants expect a difficult interview. The individual should be considered as if he or she is going to be a permanent employee.

- *Select the consultants.* Select the individuals who best meet job specifications. A company that is hiring consultants should always look first at the individuals being selected — after all, they are the ones that are actually going to do the work, not the sales or marketing representative of the consulting firm.

The company should then look at the reputation and past performance of the consulting firm to ensure that the firm will be able to provide the necessary level of service over the duration of the contract.

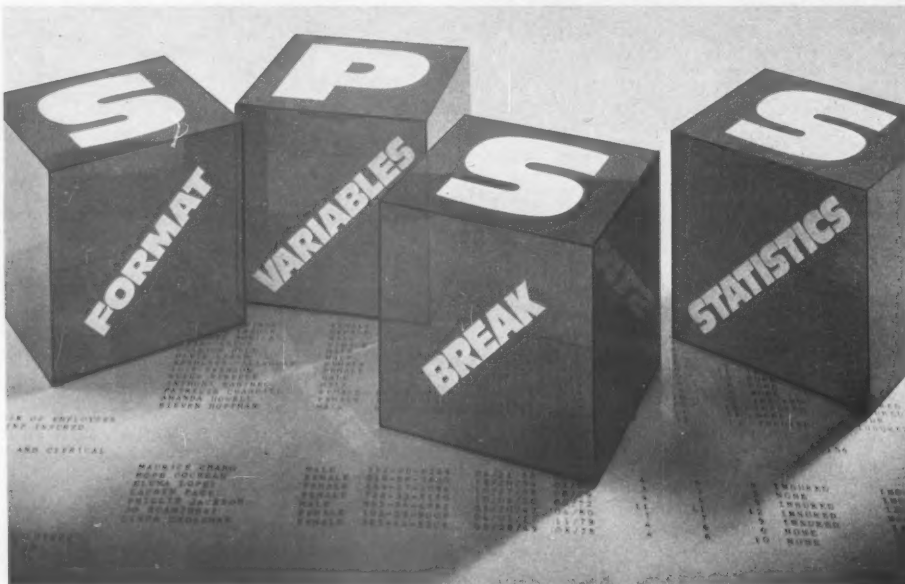
In addition, it should be considered whether the consulting personnel are full-time employees or subcontractors. The consulting firm can maintain more effective quality control over full-time employees.

- *Evaluate the performance of the consultant.* There should be an on-going evaluation of how well the consultant is doing the assigned tasks. If for any reason the performance is not as expected, do not hesitate to ask for a replacement.

A consulting firm bases a large portion of its business upon its reputation to provide quality personnel. It does not want to place people who cannot perform at very high standards of performance.

Blackmore is senior project manager at Data Base Management, Inc. (DBMI), Vernon, Conn.

REPORT WRITING MADE SIMPLE



With the power of the SPSS® Batch System behind you, you don't have to be a data processing specialist to generate highly specialized, easy to read reports. The SPSS report writer is designed to make it easy.

For example, with responses to just four key words — **FORMAT**, **VARIABLES**, **BREAKDOWN**, and **SUMMARY** — the SPSS report writer will automatically set margins, spaces, and place labels in the most logical, intelligible arrangement possible, suitable for reproduction.

As your needs progress to more complex reporting, the

system is programmed to facilitate an amazingly high degree of customization. With a few simplified English-language commands, you can easily adjust column widths, spacing, page lengths, and add custom headings, labels, comments, and footnotes.

Like all of the other capabilities of the SPSS Data Analysis System, the SPSS report writer is a research and management tool that is thoroughly and clearly

documented, assuming no previous computer knowledge or experience on the part of the user. In fact, you'll need no help from data processing people — even when you need to reduce or summarize huge amounts of data before producing reports. It's all done automatically — in one easy step!

SPSS is highly portable and low in cost. With its powerful report writer and its highly flexible, sophisticated,

and elegant Graphics capabilities, (as well as its full range of statistical and data management features) SPSS costs less than many systems that offer report writers alone!

For full information on the SPSS report writer, call or write SPSS today:
Roger Sack
SPSS, Inc.
444 N. Michigan Avenue
Chicago, IL 60611
312/329-2400

See for yourself why our report writer is another reason to choose SPSS — the largest selling data analysis system in the world.

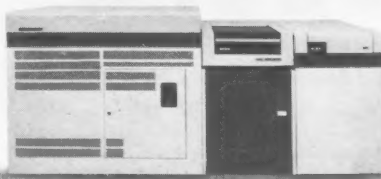


SPSS runs on: IBM 360, 370, 4300, OS, DOS, CMS and all IBM compatibles / Burroughs Medium and Large Systems / CDC CYBER & 6000 Series / Data General Eclipse & Nova / DEC Systems 10, 20, VAX, PDP-11 / HARRIS 4, 7 / HEWLETT-PACKARD 3000 / Honeywell 60 / ICL 2900 Series / Perkin-Elmer Prime 400-750 / Siemens BS 2000 / Univac 70, 90, 1100 / Other SPSS Conversions are available. Contact SPSS, Inc. for more information.

Copyright 1981 SPSS, Inc.

Buy any Wang VS computer and get an office automation system free.

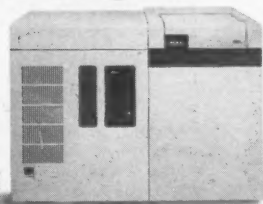
When you buy any Wang VS (Virtual Storage) computer, you're not just buying another computer. You're buying a flexible, powerful, computer system that's compatible with most mainframes and offers a range of multi-functional capabilities no one else can touch.



Wang VS 100

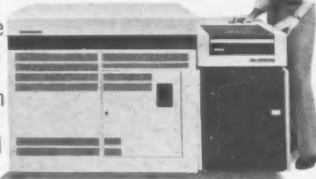
Along with Data Processing and electronic mail, you get Wang Word Processing, the world's standard. And when you consider that 80% of the information handled in most offices is in written form, that's no small extra.

But more than that, you get the only computer system that

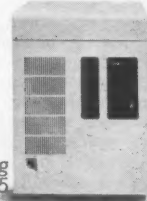


Wang VS 45

has the built-in capability to automate your entire office. A system that's expandable, upgradable, and compatible from low to high end. And because all VS systems run under one operating system and support the same software, it's the world's easiest system to learn and to use.

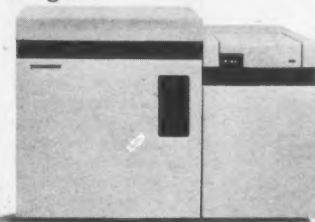


Wang VS 90



Wang VS 25

The Wang VS. When you consider all you get, and what you get it for, why consider anything else?



Wang VS 80

For a demonstration of the Wang VS computer, call

1-800-225-0643

(in Massachusetts call 1-617-459-5000, extension 5711). Or send this coupon to:

Wang Laboratories, Inc., Business Executive Center, One Industrial Ave., Lowell, MA 01851

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 Telephone _____

WANG

A448

The Office Automation Computer Company

BEFORE YOU BUY A PORTABLE TERMINAL FROM TEXAS, PRETEND YOU'RE FROM MISSOURI.

SHOW ME THE DIFFERENCE.

FEATURE	MINITERM 2200	TI 785	THE DIFFERENCE
80/132 column selectability	Yes	No	Easy selection of a variety of multi-column formats for financial, statistical and business applications.
Graphic plotting option	Yes	No	Fast, high resolution graphical output for bar graphs, pie charts and other management reports wherever needed.
Six user-definable function keys	Yes	No	Allow simple, one-step connection to network and data bases; store user-friendly prompts or daily field information for later, cost-effective transmission; battery back-up memory preserves data even when power is off.
Self Help Command Mode	Yes	No	Start-up Manual is built in. Step-by-step prompting permits terminal configuration for individual applications.
Built in 300/1200 acoustic coupler	Yes	Yes	Cuts telecommunications costs; flexible access to any data base, from any telephone.
RJ-11 telephone jack option	Yes	No	Minimizes high speed communication errors and permits unattended operation for receipt of messages during non-business, off-peak hours.
Full One-Year Warranty	Yes	No	Miniterm Reliability enables us to offer four times the industry standard warranty; on-site, same day service — nationwide.

Computer Devices has been designing, building and servicing terminals for over a decade. And that means that when you buy a Miniterm® you don't buy just a name, you buy experience and advanced technology.

You owe it to yourself to see how much more you'll get with Miniterm. We're ready to show you now. For more information, or the number of the Authorized Computer Devices Distributor nearest you, call or write today. Computer Devices, Inc., 25 North Avenue, Burlington, MA 01803.

1-800-343-5104

In Massachusetts call (617) 273-1550

We travel in the best companies.

COMPUTERDEVICES



COMPUTER
DEVICES INC.



Management System Helps Manufacturer With Job Control

HOUSTON — Planning ahead is a way of life at the Cameron Iron Works here, a leading equipment manufacturer for the oil, gas and airline industries.

That's why the company, whose DP department runs three shifts, seven days a week, went after the problem of job control before it got out of hand. Five years ago, reruns were not quite a problem, but when one did occur, the operator would have to call a programmer to obtain the restart procedures — often in the middle of the night.

As the data center continued to grow, there was an even greater need to bring reruns under control. The shop presently employs more than 80 programmers and runs an IBM 3033 and a 4341 under MVS/JES2.

Looking for a software package that would handle reruns automatically, Cameron discovered University Computing Co.'s (UCC) Eleven rerun management system. "Nothing else on the market handled generation data groups [GDG] and 95% of our tape files are GDGs," explained Carol Thomas, systems programmer.

A Natural Decision

"Eleven was a natural decision, since it does such a good job of handling GDGs and interfacing with UCC's tape management system [UCC One], which we also have," she explained.

After the system was implemented, Cameron data center employees noticed differences almost immediately. For one thing, programmers are now getting a good night's sleep. Because Eleven automatically sets up jobs for restart, operations analysts and operators are able to handle many more jobs than they used to, and the programmers generally don't have to get involved.

"For the applications under the system, they can use the on-line list-step feature," Thomas said. "Then they determine if the job is restartable."

Operations analysts also use the list step to learn which steps aren't restartable when they first bring a new job under the system's control. They can find out where they have to modify the JCL to bring it in line with the center's goal of making all steps in the job restartable.

"Eleven's on-line portion has also reduced the amount of information operators have to log manually to docu-

ment an abended job," Thomas noted. "Rather than relying on a combination of written logs and JCL listings, the operators can find out about job restarts including 'reason for rerun' by simply calling up that data on the CRT screen."

System a Big Help

Thomas noted that the system has been "a big help" when jobs abend. In preparing for the rerun, the operators might discover that they have three additional tapes input to this job. With one parameter, Eleven will allow them to run the JCL without having to uncatalogue and recatalogue the data sets or modify the production JCL.

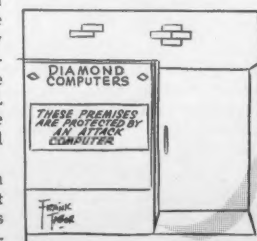
What about future plans for Eleven? "In a disaster-recovery situation, we must have Eleven available," Thomas said. "Because we'll have the production jobs on the system's history file, we won't have to look for the JCL from the previous night to find out whether it ran or not."

"All we'll have to do is inquire through Eleven," she added. "It will be a critical part of our disaster-recovery plans."

Another plan for the system is the addition of an exit to allow the tracking of CICS regions. "A lot of manual work is now being done by secretaries looking at the JCL, looking at output from various jobs and drawing up charts on how long CICS was up each day during the month and the percentage of time it was up," Thomas explained.

By putting CICS under the control of Eleven for tracking purposes, data center employees can pull that information on-line or through batch reporting. "I think it will be more accurate and much easier to compose statistics for our data center director, because he does keep track of our up time," Thomas added.

Thomas also plans to have a procedure that will allow programmers using the system for their test jobs to take advantage of the rerun handling features of Eleven.





... the one
weekly newspaper
that's designed to fulfill your
unique "need to know"...
the one newspaper that can
give you all the current
information you need to benefit
you, your organization and
your career progress...
52 weeks of incisive news,
commentary and special
reports... subscribe today,
use the attached postage paid
order form.

☐ Please enter my subscription
(details on back)

☐ I'm already a subscriber,
but I'd like you to
change my:

- ☐ address
- ☐ title
- ☐ industry
- ☐ other

My current mailing label is attached
and I've filled in new information
on the other side

Put old label or label information here

COMPUTERWORLD

Please send me COMPUTERWORLD for one year. **RATES: United States \$44; Canada, Central & South America \$110; Europe \$165; All Other Countries \$245 (Airmail Service)**

☐ Check Enclosed
☐ Am Ex ☐ BA/Visa ☐ MC
 (MC Only: List four digits above your name)

If charge we must have cardholder's signature: _____
 Expiration Date: _____

First Initial	Middle Initial	Surname										
Your Title												
Company Name												
Address												
City	State	Zip Code										

Address shown is:
☐ Business
☐ Home

☐ Check here if you do not wish to receive promotional mail from Computerworld.
☐ Check here if you're interested in receiving information on Computerworld's Index.

PLEASE CIRCLE 1 NUMBER IN EACH CATEGORY

BUSINESS/INDUSTRY

10 Manufacturer of Computer or DP Hardware/Peripherals
 20 Manufacturer (other)
 30 DP Service Bureau/Software/Planning/Consulting
 40 Public Utility/Communication Systems/Transportation
 50 Finance/Insurance/Real Estate
 60 Mining/Construction/Petroleum/Refining
 70 Business Service (except DP)
 80 Education/Machine/Healthcare/State/Local
 90 Printing/Publishing/Other Communication Service
 95 Other

TITLE/OCCUPATION/FUNCTION

11 President/Owner/Partner/General Manager
 12 VP/Assistant VP/Regional Manager
 13 Director/Controller/Finance Officer
 21 Director/Manager of Operation/Planning/Administrative Service
 22 Director/Manager/Supervisor DP/MIS Sys
 23 Manager/Supervisor Programmer
 31 Manager/Supervisor Programmer
 32 Programmer/Methods Analyst
 41 Application Engineer
 42 Other Engineering
 51 Sales Representative
 52 Other Sales/Marketing
 60 Consultant
 70 Lawyer/Accountant
 80 Librarian/Educator/Student
 90 Other



THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

CIRCULATION DEPT. 375 Cochituate Road, Rte. 30, Box 897, Framingham, MA 01701-9985

Detach here, fold, and place in post-paid envelope attached through binding.

Supply Firm Runs Growth With Software Transfer

SANTA CLARA, Calif. — The ability to transfer its in-house developed applications software easily to new processors has allowed Inmac Corp. here to grow from a two-person operation to a multimillion dollar concern during the past six years.

Software transportability across hardware generations has been the key to the computer supplies and accessories company's entire software development and maintenance strategy.

"We are currently using two — soon to be three — different processor models," according to a company spokesman. "If we had to develop and maintain separate versions of our systems, we'd need a much larger programming staff and possibly larger development systems." In addition, the firm would have to do more and longer range advance planning for DP.

Currently, the firm develops its own software centrally for a single version of each package. The company sends out identical copies of software to each branch, and when there is a problem, the corporate DP staff works out the bugs at the central office using a master copy of the package.

Once running two branch locations, Inmac's DP operation has expanded to seven Data General Corp. Nova mini-computers lined to more than 50 interactive terminals. This hardware supports order entry, inventory control, general ledger and accounts receivable/payable for 40,000 mail and phone order customers in the U.S. and the UK.

Eclipse S/140 Added

The company reported it has been able to upgrade from a Nova 3 to a Nova 4 system and now the firm is adding an Eclipse S/140. "We put comparatively small machines into what turned out to be our two biggest branches and the Nova 4 systems into our newest ones," the spokesman explained. But because the software was completely compatible among the different processors, the location of the processors was not an issue.

Inmac's processing activity runs from order entry to inventory to bookkeeping. The firm's catalog lists more than 2,000 products for the computer industry ranging from printout shredders to disk packs. About one third of the products are manufactured by the company.

The spokesman acknowledged that DP power has a significant impact on

Self-Study Course Trains ISPF Users

LOS ANGELES — Crwth Computer Coursewares has a new self-study interactive course, "ISPF (SPF) for End Users."

The course was designed to instruct users of an information center with the use and facilities of the IBM's ISPF to create and maintain their own data files.

The course can be leased for \$1,500 per year or \$3,750 for a perpetual license. Crwth is located at Suite 205, 12655 Washington, Blvd., Los Angeles, Calif. 90066.

Inmac's operation. Besides processing the 6,000 transactions going through each branch every month, the spokesman said that automation allows a more knowledgeable response to customers. Once an order goes into the machine, it is immediately checked against the most recent inventory status report to check which items are out of stock.

Overall, DP has been inexpensive. "I'd estimate that Inmac's total DP bill has been between three-quarters of 1% and 1% of gross sales. For a company as involved in pushing data around as we are, I'd say that's quite good," the spokesman concluded.

Financial Modeling ^{IFPS} ON LINE TIME SHARING

Available to Midwest users through
The Functionality Group

® Registered Trademark. Interactive
Financial Planning System from
EXECUCOM Systems Corporation.

The Functionality Group Inc.
180 North Michigan Avenue
Chicago, Illinois 60601

1-800-621-1454
312-372-6070 in Illinois

... See ?!



**Disagreements
about 3270 Response Time?**

**Only TEMPO™ provides ABSOLUTELY BELIEVABLE
RESPONSE TIME MEASUREMENT
for IBM 3270 networks.**

TEMPO Response Time Monitors measure the exact time IBM 3270 terminals are unavailable to the user — the minutes, seconds, and fractions of seconds that elapse between when the user presses the enter key until the terminal is available to the user again.

TEMPO Response Time Monitors WILL:

- Install easily and quickly on IBM 3276, 3278, 3275, 3277, 3279, 8775, or Memorex 2078 terminals;
- Operate in all IBM environments;
- Build a data base of individual response times by time of day, summarize the data, construct histograms, print and display the data at terminal and host sites;
- Help you eliminate bottlenecks; justify system expansion; and improve terminal operator's productivity.

☐ **Yes,** I am interested in TEMPO Response Time Monitors. Please send more information.

☐ Please call me.

☐ I am interested in obtaining a trial monitor.

Printed Name _____

Title _____

Company _____

Address _____

City _____

State _____ Zip _____

Telephone _____

Number of terminals installed _____

Model(s) _____

Send to: TEMPO • Department 219 • DTSS Incorporated • 10 Allen Street • Hanover, NH 03755

Or
CALL TEMPO at 603/643-6600, ext. 615 for more information.

DTSS Incorporated A Subsidiary of Metropolitan Insurance Companies with offices in Hartford, CT • Atlanta, GA • Woodbridge, NJ • Chicago, IL • Dallas, TX •



Graphics Obtained Four Times Faster Data Center Finds COM Recorder Saves Time

WILMINGTON, Del. — After the Information Systems Department (ISD) of E.I. Du Pont de Nemours and Co. replaced one computer output microfilm (COM) recorder with a newer model, it received graphics imaging services four times faster than before.

According to John Matthey, supervisor of support services in the corporate data center, which handles data processing for the corporation, the center previously offered a COM alternative in

1970 by using an outside service bureau.

In 1973, ISD installed its own COM facility. Since then, the facility has grown from a one- to a three-shift operation with a sevenfold work load increase requiring nine operators and three limited-service weekend operators. ISD now provides COM and printout services for Du Pont throughout the U.S.

ISD recently installed a 3M Corp. 735 COM recorder, supplementing a 3M 710 unit that was already in place.

The new unit provides flexible graphics imaging services at four times the speed of previous COM devices, Matthey said. During an average month, ISD produces three million pages of COM output and 16 million duplicate frames. About 95% of the output is in microfiche form.

"Our new COM unit is faster, as large, more economical and it produces a sharper image than the equipment previously available," Matthey said. Operating at over 22,000 line/min, the two 3M recorders handle throughput more quickly than the high-speed laser printers, he claimed.

The COM facility presently produces 16mm roll film used in either cartridge or

reel form, 35mm roll film and microfiche at reduction ratios of 24X (63 full-size pages per fiche), 42X (208 full-size pages per fiche) and 48X (270 full-size pages per fiche). Among fiche options offered are title extractions, indexing, edit breaks and form overlays. The latter are produced by either flashing a form drawn on glass plate or from graphics created with COM software.

Management supports and encourages the use of COM, and since ISD charges for its services, department managers are finding that it is less expensive and easier to use than printout.

Although much COM output is straightforward, Matthey noted a growing demand for business graphics and specialized forms work. One of the criteria in selecting the 3M 735 COM unit was its ability to perform business graphics and specialized forms work with high resolution and data compaction capabilities, he added.

With 3M COM/Quest software, the data center has designed flexibility, Matthey said. Title and edit breaks are built into the software and expanded alphanumerics enables the data center to format output for fast and easy-to-access retrieval.

For example, Du Pont produces rate route sheets on

microfiche. The COM generated shipping rate data is copied and distributed to railroad and trucking terminals. "We use microfiche to compact the information for easy distribution, storage and accessibility and graphics design of the microfiche to speed up the retrieval of data," Matthey said.

Cost-Effective

The use of COM is cost-effective for Du Pont, Matthey noted, but precise savings are sometimes difficult to estimate. He cited the example of savings: The data center charges 28 cents for duplicate fiche which, at a 48X reduction, contain 270 images. In comparison, it charges three cents per page of printout, or \$8.10 for the number of pages that can be contained on one fiche.

Distribution costs are also much lower, since a microfiche can be mailed for the cost of a first-class stamp. "Compare that to the cost of distributing up to 270 pages of printout containing the same information," he said.

"Thirty microfiche can contain as much data as an entire mile of computer printout," Matthey said. "It reduces paper and handling costs in data processing, since COM eliminates decollating, bursting, binding and heavy paper carton lifting."

THE INSTITUTE FOR CERTIFICATION OF
COMPUTER PROFESSIONALS ANNOUNCES THE

CCP ANNUAL
EXAMINATION
SCHEDULED FOR DECEMBER 11, 1982

The annual examination for the Certificate in Computer Programming (CCP) will be held on December 11, 1982, at selected test centers throughout the world.

Specific requirements for this year's examination are detailed in the "Certificate in Computer Programming Examination Announcement and Study Guide." The study guide and application form for the 1982 examination are available on request from ICCP.

Deadline for Filing Application is October 15, 1982

Please forward the "Certificate in Computer Programming Examination Announcement and Study Guide" along with application and test site list.

Name _____

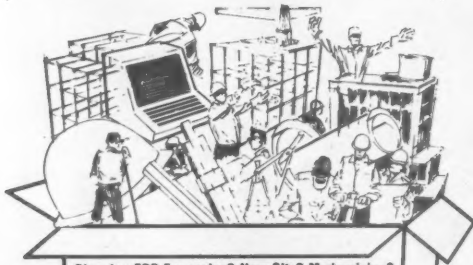
Street Address _____

City _____

State or Province _____

Zip Code _____

MAIL COUPON TO: Institute for Certification of Computer
Professionals Certification and Testing Section
304 East 45th Street
New York, N.Y. 10017



Planning EDP Expansion? New Site? Modernizing?

WE PACKAGE DATA CENTERS

We design, engineer, build — meeting and beating deadlines, even when building over, around or under you — without costly interruptions so you can maintain your business as usual. Most of our projects are accomplished in half the time.

We are the engineers and builders of more than

600 DATA CENTERS

If you are a quality conscious company wisely interested in performance as well as economy, we can construct a building to house your computer facility, alter an existing floor, or rejuvenate and expand your present facility, including your total support area.

Simply call or write to arrange a convenient meeting to discuss your project, concepts, and budgets. In confidence, of course.

(212) 674-8600

DP FACILITIES INC., NATIONAL
Div. F.C.I. Facilities Construction, Inc.
250 Park Ave. South, N.Y., N.Y. 10003

CICS MAP GENERATOR AND 3 OTHER SOFTWARE TOOLS @ \$99/YR

CICS MAPR creates BMS macros from a screen layout entered as card images on a CRT. Free your programmers from the time-consuming drudgery of coding and punching BMS macros. CICS MAPR also prints a screen layout.

LISTCAT PLUS replaces listcat function of IDCAMS and reduces size of printout by 60 to 1. Over 500 users are saving disk space, paper, and time by using LISTCAT PLUS.

COBOL GLOSSARY prints system-wide cross reference lists showing every program that uses each data name, COPY book, "CALL"ed subprogram, file, etc. Makes maintenance, trouble shooting, and conversions easier for over 100 users. Uses COBOL source statements as input.

SOURCE PROGRAM COMPARE lists differences in two versions of a program, JCL deck, etc. Handles inserts and deletes. Ignores sequence numbers.

\$395 or \$99 per year each.
COBOL SOURCE PROVIDED
CALL OR WRITE FOR MORE
INFORMATION OR FREE TRIAL.

MACKINNEY SYSTEMS
Rt. 2, Box 270-A
FAIR GROVE, MO 65648
(417) 833-9553

Calendar

Oct. 2-3, New York — **CICS Command Level Intensive**. Contact: Sys-Ed, One Park Ave., New York, N.Y. 10016.

Oct. 4-6, Topeka, Kan. — **Feedback '82**. Contact: Ken Orr & Associates, Inc., 715 8th, Topeka, Kan. 66607.

Oct. 4-6, New York — **IMS Data Base Access DL/1**. Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Oct. 4-6, New York — **MVS Dump Debugging**. Contact: Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Oct. 4-8, Boston — **C Language Programming**. Contact: Computer Technology Group, Telemedia, Inc., 310 S. Michigan Ave., Chicago, Ill. 60604.

Oct. 4-8, Munich — **IMS Systems Management Workshop**. Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Oct. 5-7, Phoenix — **Southwest Semiconductor Exposition**. Contact: Cartledge & Associates, Inc., Suite 1014, 491 Marcara Ave., Sunnyvale, Calif. 94086.

Oct. 5-8, Providence, R.I. — **Quality Circles Facilitator Training**. Contact: The Center for Management Development, Bryant College, Smithfield, R.I. 02917.

Oct. 6-8, Boston — **Basic: An Introduction to Computer Programming for Managers**. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 6-8, Los Angeles — **Automated Office VI**. Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

Oct. 6-8, Danvers, Mass. — **Automated Office of Tomorrow**. Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

Oct. 6-8, White Plains, N.Y. — **An In-Depth Comparison of the Leading CAD/CAM Systems**. Contact: Orr Associates, Inc., 21 Chambers Road, Danbury, Conn. 06810.

Oct. 6-8, Chicago — **Financial Information Systems**. Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

Oct. 6-8, New York — **Magnetic Media, "Tape/Disk Talk" Workshop**. Contact: Stored Information Systems, 102 Cresci Blvd., Hazlet, N.J. 07730.

Oct. 7, Chicago — **Selection & Procurement of Small Business Computers**. Contact: Eduteach, Inc., Suite 907, 162 N. State St., Chicago, Ill. 60601.

Oct. 7-8, New York — **IMS Data Communications**. Con-

tact: Chubb Advanced Training Center, 480 Morris Ave., Summit, N.J. 07901.

Oct. 7-8, Atlantic City, N.J. — **UFO National Users Group Meeting**. Contact: Product Manager, Oxford Software Corp., 174 Blvd., Hasbrouck Heights, N.J. 07640.

Oct. 7-8, Minneapolis — **Seminars for the Systems Analyst**. Contact: Executive Development Center, 324

Management and Economics, 271-19th Ave. S., University of Minnesota, Minneapolis, Minn. 55455.

Oct. 7-8, St. Louis — **ACM Conference on Security**. Contact: Association for Computing Machinery, 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 7-8, Washington, D.C. — **Auditing Cobol Application Programs**. Contact: MIS (Continued on Page 58)

\$ CAPITAL AVAILABLE \$

A nationally recognized firm has decided to diversify into the computer industry. They are looking for a company that requires substantial capital and management assistance. The ideal candidate must:

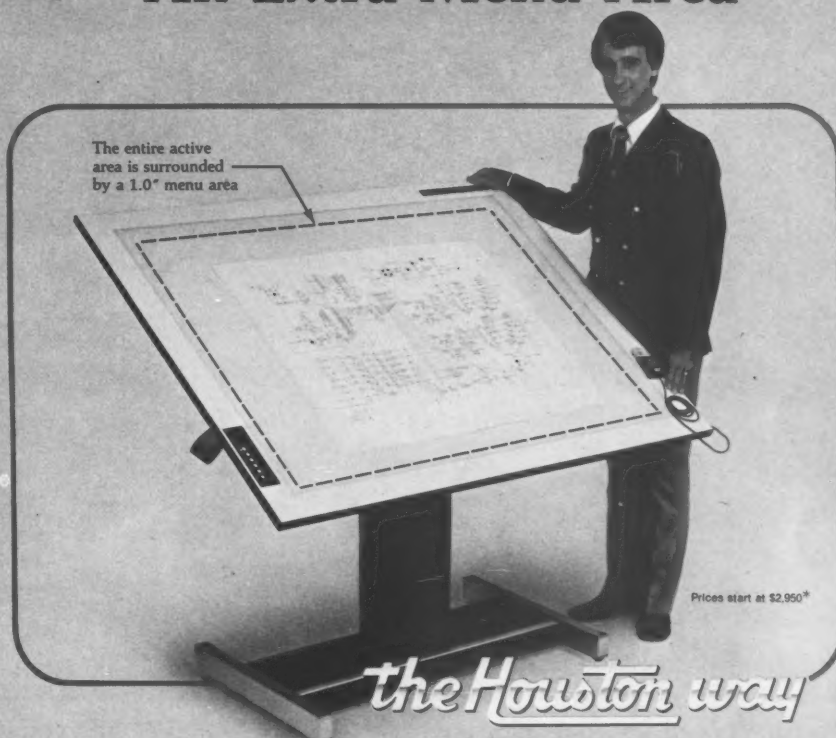
- Have an existing product or service
- Be capable of returning over \$1 million per year
- Possess rapid growth potential

A consulting firm has been retained to review potential opportunities and make a preliminary selection. Interested parties should send a brief business plan to:

THE USER GROUP, INC.
443 N. NEW BALLAS □ ST. LOUIS, MO 63141

Selected opportunities will be contacted for further information. All replies will be held in strict confidence. No phone calls please.

The COMPLØT® Series 7000 Digitizers Provide An Extra Menu Area



Now you don't need a separate pad for menus

With the Series 7000 translucent (at no extra expense, of course) digitizers, you get a full active area, 12"x12", 17"x24", 36"x48" or 42"x60", plus a border area especially designed for user-defined menus. Again, no additional expense.

And the innovative design concepts don't stop there. Imagine 40 user configuration controls and host computer down loads allowing you to tailor your digitizer to your specific application. Point, stream, switch stream and incremental modes, fixed or relocatable origins — of course.

Also — separate stylus/cursor plugs are located on each side of the digitizer for ease of operation for left and right-handed people. Power-tilt stands (with or without back lighting) are available for maximum flexibility and operator comfort.

What about this combination in one digitizer? Accuracy of $\pm 0.005"$ right up to the edge of the active area — up to 150 coordinate pairs per second digitizing rate. Resolution as fine as .001" !!!



The Series 7000 digitizers give some additional blessings — no grid adjustment, no demagnetizing (biasing), no problem with temperature or humidity over the broad range of operating conditions — EVER.

One might say the menu is matched by a complete digitizing meal . . . the Houston way.

We know these wonders have tempted your appetite, but COMPLØT® Series 7000 digitizers have additional features that may intrigue you even more.

Get the complete story. Contact Houston Instrument, P.O. Box 15720, Austin, Texas 78761 (512) 835-0900. For rush literature requests, outside Texas, call toll free, 1-800-531-5205. For technical information, ask for operator #6.

INSTRUMENTS & SYSTEMS DIVISION
Together...we'll create tomorrow.

BAUSCH & LOMB

* U.S. suggested retail price. OEM price available.
* Registered Trademark of Houston Instrument, FCC class A tested.

Everyone can



You don't need a big operation anymore to justify a VAX™ computer.

Because now Digital introduces the smallest in a growing line of VAX systems. The VAX-11/730.

It's just the right size for small departments. And just the right price.

For less than \$60,000* you can have a VAX-11/730 packaged system, with 1 MB of 64K chip memory, 131 MB of disk storage (including Winchester drive), and capacity for 8 on-line users. All in a single cabinet just 42" tall. You also get a console printer. And, of course, the ability to increase memory, add disks, and bring on more users.

For an even smaller department you can choose a smaller version for less than \$50,000* with 20 MB of disk and a starting capacity of four users.

Either way, you get a computer that's every inch a VAX. With VMS™ Version III software. The availability of commercial and technical languages. VAX Information Architecture for distributed data access. Digital's office automation software for electronic mail, calendar keeping, and word processing. And third-party software written for the VAX family, from CAD/CAM to econometrics.

So whatever you're doing, you can do it with a VAX-11/730.

You'll be fully supported by Digital's customer service organization, available around the world.

Naturally, you can use Digital's DECnet™ networking software, and protocols like X.25 and SNA/SDLC for communications with other computer architectures. So your small departments can stay in close touch with the rest of your company.

use a little VAX.

Introducing
the VAX-11/730.



And when small departments get bigger, they can move up to a larger VAX without rewriting their software. Because the VAX-11/730 is totally compatible with the rest of the VAX family.

You don't have to be big to have big computer power.

Now there's a VAX for everyone.

To learn more about the VAX-11/730, call our toll-free number: 800-DIGITAL, extension 200. Or send the coupon to:

Digital Equipment Corporation, 129 Parker Street, PK3-2/M94, Maynard, MA 01754.
Attn: Media Response Manager.
Digital Equipment Corporation International,
12 Av. des Morgines, CH-1213 Petit-Lancy/Geneva.
In Canada: Digital Equipment of Canada, Ltd.

*Prices apply in the U.S. only.

I'm interested in a little VAX.

Name

Title

Organization

Address

City State Zip

☐ Have a sales representative call me. ☐ Please send me literature.

digital

CW-9-13-2

Calendar

(Continued from Page 55)

Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

Oct. 7-8, Geneva — **Management Systems of International Risks.** Contact: Insig, Institut de Recherche Interbancaire, Association Sans But Lucratif Regie par la Loi de Juillet 1901, 40 Rue de Monceau, 75008 Paris, France.

Oct. 7-8, Washington, D.C.

— **Data Communications: Advanced Concepts and Network Management.**

Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 7-8, New Orleans — **Operational Audit of the DP Function.** Contact: University Seminars, Suite 2846, 420 Lexington Ave., New York, N.Y. 10017.

Oct. 7-8, Chicago — **Data**

Administration: Development and Practice. Contact: Arnold Barnett, Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Oct. 7-8, Boston — **Software Engineering.** Contact: Battelle Seminars and Studies Program, 4000 N.E. 41st St., P.O. Box C-5395, Seattle, Wash. 98105.

Oct. 7-14, New York — **Introduction to Assertiveness Training.** Contact: Women

in Data Processing, Inc., Suite 2008, 310 Madison Ave., New York, N.Y. 10017.

Oct. 9-10, New York — **CICS Command Level Intensive.** Contact: Sys-Ed, One Park Ave., New York, N.Y. 10016.

Oct. 10-14, Atlanta — **Information Technology '82.** Contact: Association of Records Managers and Administrators, Inc., Suite 215, 4200 Somerset Drive, Prairie Vil-

lage, Kan. 66208.

Oct. 11, Nairobi, Kenya — **Plenicom '82 International Telecommunications Exposition.** Contact: Horizon House Expositions, Inc., 610 Washington St., Dedham, Mass. 02026.

Oct. 11, Tampa, Fla. — **Computer Graphics in Architecture & Engineering.** Contact: George Borkovich, Editor, 3400 Edge Lane, Thorndale, Pa. 19372.

Oct. 11-13, Los Angeles — **IMS/VS Dump Reading.** Contact: Data Base Management, Inc., 281 Hartford Tnpk., Vernon, Conn. 06066.

Oct. 11-13, Minneapolis — **The Seventh Conference on Local Computer Networks.** Contact: Rick Tett, Software Support International, Inc., 4425 N. Victoria St., Shoreview, Minn. 55112.

Oct. 11-13, Denver — **The 1982 Fall Conference for the Society for Computer Applications in Engineering, Planning and Architecture.** Contact: Patricia C. Johnson, Executive Director, Cepa, Inc., 358 Hungerford Drive, Rockville, Md. 20850.

Oct. 11-15, Englewood Cliffs, N.J. — **Software Physics & Systems Management.** Contact: Institute for Software Engineering, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Oct. 11-15, Los Angeles — **C Language Programming.** Contact: Computer Technology Group, Telemedia, Inc., 310 S. Michigan Ave., Chicago, Ill. 60604.

Oct. 11-15, Los Angeles — **Software Maintenance: Tools, Techniques and Management Strategies.** Contact: University of California, 6266 Boelter Hall, UCLA Extension, Los Angeles, Calif. 90024.

Oct. 12-14, London — **Viewdata '82.** Contact: On-Line Conferences Limited, Argyle House, Northwood Hills, Middlesex, HA6 1TS, UK.

Oct. 12-14, Arlington, Texas — **Computer-Aided Productivity Improvement System.** Contact: C.H. Pete Link & Associates, P.O. Box 13635, Arlington, Texas 76013.

Verbatim Datalife™ flexible disks now come in a bold, new storage box. But more important, they now come to you with a five year warranty.*

We can give you a warranty this long because we're confident the way we make Datalife disks will make them perform better, last even longer.

All of our Datalife disks feature seven data-shielding advances for greater disk durability, longer data life. To protect your data from head-to-disk abrasion. To shield your data against loss due to environmental conditions. To insure a longer lifetime of trouble-free data

recording, storage and retrieval.

Every Datalife disk is extensively tested under the most extreme conditions. Critically-certified to be 100% error-free. Assuring you an added margin of performance, no matter what the operating conditions.

And we back it up with a five year warranty. Five times longer than the industry standard. Because Verbatim is the standard of excellence.

• For flexible disks you can depend on—a lot longer—call (800) 538-1793. In California, or outside the U.S. call (408) 737-7771

collect for the name of your Verbatim dealer.

If you want longer data life, keep all your data on Verbatim Datalife. Our name is the promise. Our warranty is the proof.



Verbatim

Here's the most exciting part of Verbatim's new packaging.

5 Year Warranty

© 1982 Verbatim Corp. Datalife is a trademark of Verbatim Corp. *See Verbatim's warranty policy for details.



WE COULD CHARGE AS MUCH AS WE WANT FOR A FULL-COLOR GRAPHICS SYSTEM AS ADVANCED AS THIS.

High resolution 19" monitor displays 16.8 million colors, 256 at a time in a 768H x 575V window

Self-contained 5-1/4" .5 MByte floppy disk drive for data transportability and back-up

Self contained 5-1/4" 10.4 MByte Winchester drive for mass storage

Detachable VT100-style keyboard with built-in joystick

Anti-aliasing feature of the graphics processor smooths out the "jaggies" typical of raster graphics—contained within the hardware and software, requiring no processing by the host computer

12 user-optional Q-BUS slots powered and wired for a broad choice of peripherals and additional memory

LSI-11/23 CPU with 512K bytes memory features 22-bit memory addressing (expandable to 4MBytes), thousands of field-proven applications and upward compatibility with PDP-11 and VAX

1024 x 1024 x 8 planes of color graphics memory, ideally suited for printed circuit and VLSI design as well as other CAD applications and 3D modeling

BUT UNTIL SEPTEMBER 30th, \$24,800 IS AS MUCH AS WE WANT.

Finally, there's a full-color graphics workstation that's a good deal. A good deal more capable and a good deal less expensive.

Introducing the AEDS11 desktop system. It comes complete with a sharp 19" screen, detachable keyboard, and slim 7" chassis containing an LSI-11/23 CPU and both a 5 1/4" Winchester and a floppy disk drive. And 16.8 million colors generated by the internal graphics processor. It's the most powerful yet compact system

available. Ever.

The AEDS11 desktop system puts precision color control and full micro-computer processing in a price range nobody else has ever come close to. Even with systems offering considerably less.

At our standard price of \$31,000, it's easily the industry's price/performance

leader. But at our introductory price of just \$24,800, good only until September 30, for delivery in 1982, it's an incredibly good deal more at an incredibly good deal less. (Optional operating systems software available for an additional charge.)

So call any regional sales office listed below, or Mike Thorpe in our Sunnyvale corporate office at (800) 538-1730 before September 30th and get the biggest discount in color graphics.

**ADVANCED
ELECTRONICS
DESIGN, INC.**

440 Potrero Ave. Sunnyvale, CA 94086, (408) 733-3555 Telex 357-498

New England (617) 256-1700 • Los Angeles (213) 592-4469 • New York (201) 238-6322 • Detroit (313) 352-4290 • Washington D.C. (301) 760-4310 • Houston (713) 688-0700 • Chicago (312) 565-1718 • Atlanta (404) 973-1758 • Denver (800) 538-1730

EDITORIAL

Time for a New Script

While the wizards of cinematic special effects often portray the computer as an elaborate device with flashing lights that works on such complex problems as spacecraft monitoring, the role that computers play in the work place — a far more banal scenario — is beginning to call for a new script.

During the past decade, automation has made significant inroads into the work place — on the factory floors and in the clerical pools. Now the technology is reaching up into the ranks of middle and executive management.

The prospect of a large segment of workers being displaced by automation is creating a stir in the labor movement. In fact, technology issues may revitalize the entire union movement, which lately has been viewed in some quarters as primarily a vehicle for obtaining cushy fringe benefits packages.

The "Technology Bill of Rights" adopted by the International Association of Machinists and Aerospace Workers [CW, Sept. 6] is an encouraging beginning. This manifesto seeks to ensure that the quality and content of jobs will be enhanced rather than denigrated by automation. In other words, machines must fit the needs of people rather than vice-versa.

Other unions are seeking to involve workers in management decisions to automate, a subject about which workers are rarely consulted.

Technology issues are admittedly in the nascent stage when it comes to unions. In the future, perhaps these organizations will serve as a catalyst both for ensuring that automation preserves the quality of the work place and for permitting automation to fulfill the productivity gains required by U.S. industry.

Unions would be wise to cope with the challenge of automation by balancing both sides of the coin rather than falling prey to the paranoia that the prospect of automation often provokes.



LETTERS

Mips and Measurement

While I appreciate the difficulty in using charts to compare performance among computers from various vendors [CW, Aug. 2], I must comment on the inherent flaws in using millions of instructions per second (Mips) as a measurement of CPU throughput.

I found the Computerworld-estimated Mips ratings for Honeywell, Inc. DPS 6/92 and 6/96 32-bit supermini-computers to be far below other conclusions. The chart indicates a Mips rating of 0.62 for each processor.

Other thoroughly documented benchmarks conducted by Honeywell and others show Mips for these machines to be as high as 1.8.

However, I'm not writing merely to suggest a correction to your figures vs. ours. It's the practice of applying Mips to CPU throughput that I feel is both misleading to the reader/user and potentially dangerous to the vendor.

As you will agree, an "instruction" in one system doesn't always do as much work as an instruction in another. Some CPUs have mostly simple instructions that go very quickly, but it takes many of them to do anything useful.

Other computers are designed with more complex instructions; each one takes longer but you don't need as many. A system of the first kind can have a much higher Mips rating than one of the second, without giving a user any more real horsepower.

I encourage Computerworld to use its influence to push for a Cobol equivalent to the Fortran Whetstone program, where CPU performance is based on a rigidly defined program statement that removes all variables and optimizing, which together cloud the interpretation of Mips.

Perhaps the U.S. Steel benchmark, widely recognized in the industry but not even a de facto standard,

could be used.

I know Honeywell is not alone in its aversion to quoting Mips figures on its processors. Let's see if we can all work through the established DP organizations to formulate a totally objective program for use by all processors to arrive finally at a valid test of machine power.

Jessie W. Mobley

Director

Product Marketing Support

Honeywell, Inc.
Waltham, Mass.

Opportunity to Explode

I am writing in reference to "This Is a Computer — Have You Paid Your Bill?" [CW, Aug. 9]. Having been a victim of a computer call, I have firsthand knowledge of the problem. In my opinion, anyone who tries to sell me anything over the telephone is invading my privacy. Once the computer connects, it will not disconnect until there is a response or it runs to the end of its cycle.

I can't imagine anything more terrifying than to have my child choking on something, my husband having a heart attack or my house on fire and not being able to call out for assistance because some uncaring idiot of a company out for a few dollars' profit has my telephone line tied up. My telephone line is for my use only.

Telephone solicitors do not receive a warm welcome in my household. I most wholeheartedly support any and all legislation to force companies to allow a break in the telephone connection. Better yet — legislation completely outlawing computer calls.

Thank you for the opportunity to explode!

Sheri Sweet

Programmer/Analyst

Central State University
Edmond, Okla.

DATA PAST

Five Years Ago Sept. 12, 1977

NEW HAVEN, Conn. — A special agent for the U.S. Drug Enforcement Administration (DEA) allegedly embezzled computer printouts from the Narcotics and Dangerous Drugs Information System for use in a scheme to identify DEA informants and facilitate importation of marijuana, according to a grand jury indictment issued here.

NEW YORK — Judge David N. Edelstein, apparently agreeing with government charges that IBM withheld certain damaging information from government trial attorneys, decided to appoint an examiner to search the corporate files of the computer giant.

The information the Justice Department wanted was IBM's Lease Base Machine Inventory and Purchase Base Machine Inventory, both part of IBM's management information system.

Ten Years Ago Sept. 6, 1972

WHITE PLAINS, N.Y. — IBM raised the rates for systems engineering services, some field engineering services and the minimum monthly maintenance charges on selected pieces of equipment.

The price rise for systems engineering services was between 5% and 10% and would affect the greatest number of users, while the higher rises for field engineering services was to affect only those customers with purchased machines.

SALT LAKE CITY, Utah — A programmable front-end processor that could support non-IBM terminals as well as replace IBM communications controllers was introduced by Sperry Univac.

The 3760 communications controller was said to be plug-compatible with the IBM 360/370 mainframes and marked Univac's initial offering as an IBM replacement vendor.

SOFTLINE/Werner L. Frank†

Micro Software/Hardware: The Profit Picture

In a previous column, we addressed the overall economics of software distribution for computer programs aimed at the microcomputer marketplace [CW, Aug. 30]. We presented a business model for the distribution network, including the author, publisher, distributor and retailer/dealer. We showed that while the software author and publisher have substantial opportunities for leveraging profitability, the distributor and dealer face the squeeze typical in a consumer-oriented marketplace.

Another important dimension in marketing is the selection of a pricing strategy to generate optimal returns to the various participants in the marketplace. A sensitivity analysis based on varying product prices can provide the analytical basis for making such marketing decisions.

If we postulate a software product with a retail price of either \$200 or \$400 and assume a four-to-one reduction in sales volume resulting from doubling the price, we obtain projected sales of 25,000 and 6,250 units, respectively. This produces the following comparison, given the indicated participant's share of the retail sales price:

Product Price	\$200	\$400
Units Sold	25,000	6,250
Total Retail Sales	\$5 million	\$2.5 million
Author's Net at 10%		
	\$500,000	\$250,000
Publisher's Net at 35%		
	\$1,750,000	\$875,000
Distributor's Net at 20%		
	\$1 million	\$500,000
Dealer's Net at 35%		
	\$1,750,000	\$875,000

	Price		Cost of Goods		Gross Margin		Cost of Sales		Hardware Unit Profit		Software Unit Profit		Total Profit*	
	H	S	H	S	H	S	H	S	\$	%	\$	%	H	S
Retailer	\$4,000	\$500	\$2,800	\$325	\$1,200	\$175	\$800	\$100	400	10	75	15	20	3.75
Distributor	2,600	325	2,000	225	600	100	400	65	200	8	35	11	10	1.75
Manufacturer/Publisher	2,000	225	800	50	1,200	175	600	130	600	30	45	20	30	2.25
Developer/Author	800	50												

(H = Hardware; S = Software)

* Assume sale of 50,000 units. Figures are in millions of dollars.

The pretax profit for each participant can be derived through the following process:

1. Assume the author's cost of development is \$100,000. The net profit for each example would then be \$400,000 and \$150,000, respectively. Clearly, the higher volume produces greater benefit.
2. The publisher has a fixed cost of \$30 for each unit of software sold to cover packaging and advertising. The remaining costs of marketing and administration are variable and comprise 25% of the net sales. Thus:

Product Price	\$ 200	\$ 400
Publisher's Net		
Sales	1,750,000	875,000
Fixed Costs	750,000	187,000
Variable Costs	582,000	281,000
Pretax Income	\$438,000	\$407,000

Obviously, the publisher has little to gain from this price differential if the evaluation is based only upon net income received.

3. The distributor and dealer essen-

Software/Hardware Economics

tially share their combined overall profit, estimated at 20% of the retail price. For the two cases at hand, this amounts to a significant absolute differential — \$1 million vs. \$500,000.

Assuming that the unit sales volume increases by more than the ratio of the decrease in price, we conclude that the author and distributor/dealer are likely to derive significant benefit from low unit prices.

Quite apart from arithmetical calculations, lower prices render an additional benefit if they result in higher sales volume. They facilitate market penetration. This in itself is a positive factor in establishing the product. Market share begets more sales on its own account, and once the product is well established, there is always the prospect of raising the price to obtain further advantages.

Hardware Impact

Now we examine yet another factor, the impact of the hardware sale that may accompany the sale of soft-

ware. Traditionally, hardware sales have led to software purchases. To attract the buyer, the computer store dealer offers heavily discounted hardware, hoping that ancillary purchases of peripherals and software at more favorable margins will enhance profitability.

Today the trend is toward identifying desirable software first and then purchasing the hardware necessary for its operation. How will this change the pricing and buying factors in microcomputer retailing?

We postulate a model reflecting the sale of a microcomputer system at a list price of \$4,000 with an accompanying purchase of \$500 worth of software. This software purchase at 12.5% of the hardware value reflects present marketplace experience with first-time buyers.

The accompanying chart breaks down the price and cost structure, showing the participation of retailer, distributor, manufacturer/publisher

(Continued on Page 68)

READER COMMENTARY/Kenneth Wozniak†

Rethinking Ethics for DP Professionals

An increasingly important and relevant topic in the field of social ethics is professional ethics. For those of us in the data processing industry, professional ethics means ethics for DP personnel. Donn B. Parker's article, "Ethical DP Behavior Requires Action Plan" [CW, Aug. 16], aimed at sensitizing us to the need for ethical concern among DP professionals.

Parker's choice of the term "comprehensive action plan" revealed his concern that language about professional ethics be translated into tangible results in the actions of programmers, analysts, operators and managers.

We should all be grateful for Parker's efforts at helping us to consider the meaning of ethics for computer professionals.

In listing his 10 elements of a sound plan of action for encouraging ethical behavior, Parker made some points that deserve to be underscored. The role of exemplary behavior, for example, especially on the part of upper management, must be stressed, particularly if the behavior is accompanied by attitudes and speech that mitigate against any possible charge of hypocrisy or egoistic self-interest.

The use of rehabilitation programs

is a strong and clear demonstration of corporate concern for the long-term well-being of employees. Such a concern is one of the social responsibilities incumbent upon any firm that is motivated by a concern for overall social betterment, not just corporate profits.

To focus attention on ethics through briefings, courses and reading is a fine way to encourage the general development of employees and diminishes the need, in many cases, for employee rehabilitation.

Driving Motive?

I cannot, however, give wholehearted approval to what Parker wrote. Central to his article was the notion of the need to develop a code of ethics, with attendant sanctions, penalties, punishments and rewards, in order to encourage ethical behavior. From one of his previous discussions I suspect that the main driving motive behind his emphasis upon code development is a concern to secure public trust of the DP profession and thereby to ensure power, privilege, authority and monopoly.

In *Computer Abuse*, authored by Parker, Susan Nycum and S. Stephen Oura (Washington, D.C., National Science Foundation, 1973), pp. 68-69,

Parker wrote: "While the community may value the services provided by a profession, the latter is dependent upon public trust for its powers and privileges. Furthermore, to retain this monopoly and authority, a profession makes explicit the collective claim of its members of their commitment to social welfare and to ethical codes of conduct supported by a self-regulative control mechanism not to abuse (and therefore to protect the sanctity of) this trust..."

"Thus, declaration of the code of ethics is a necessary condition for the establishment of public trust in a profession which, we have argued, then permits the professional group to attain authority and a monopoly over its service."

It is at this point that Parker goes awry on his understanding of the nature and purpose of ethics, as well as the means by which good behavior is encouraged; for ethics is more than the development and enforcement of codes, and the goal of desirable behavior is not best served through the threat of penalty or the promise of reward.

Furthermore, the purposes of professional ethics should not include the attainment of power, privilege, authority and monopoly.

Darrell Reeck, a professor at the University of Puget Sound, reminds us in *Ethics for the Professions* (Minneapolis: Augsburg Publishing House, 1982), p. 69, that professional codes were in effect during the Nazi era, yet the ethics of the German professionals were never more reprehensible.

Additionally, Reeck notes that former President Nixon's lawyers committed disreputable acts in spite of the code of the American Bar Association, which they had all presumably affirmed.

It simply is not the case that codes — even when accompanied by sanctions — instill within people convictions regarding proper action. They make demands, but they totally lack enabling power.

If professional ethics does not primarily have to do with codes and sanctions, or the securing of power and the like, then what is its concern? The answer to such a question would fill volumes, so I will limit myself in this article to the fundamental issue — the meaning of ethics within a professional group.

It is necessary to discuss ethics for a specific professional group as opposed to ethics in general because of

(Continued on Page 64)

READER COMMENTARY/Jack Bologna†

Managing High-Tech Employees: Perceiving

Are high-technology workers different from workers in other industries?

That they are different will be attested to by any number of managers who have had the burden of supervising computer and information science professionals.

But how do these modern-day Einsteins, Pasteurs, Picassos and Edisons differ from workers in other professions? In particular, information processing professionals have a strong need for achievement and feel little need for relationships and affiliation.

Other Attributes

There are many other attributes that can be observed in computer and information science professionals and other types of high-tech employees. Some of these are:

- They identify with their art or technology more than with their organization's goals. As a consequence, they tend to be more mobile and quicker to change employers.
 - Salary and fringe benefits (financial returns) are not as important to them as the meaningfulness of their work.
 - They are more task-oriented than they are relationship-oriented, so relationships with peers and superiors are not as important to them as getting the job done and getting it done right.
 - They supply their own motive power and neither need nor desire close supervision. They work well — perhaps best — on their own.
 - The tasks they enjoy most are those that are challenging. Routine and maintenance-type tasks are not much to their liking.
 - They prefer their leaders to be supportive, participative and achievement-oriented, rather than maintenance-minded or directive in style.
 - They tend to be more vocal about their feelings and they fear retribution less than other types of employees (perhaps because their talents are in such great demand and other employment opportunities abound).
 - They place a premium on tasks that require a variety of skills and activities and can be accomplished in whole or major part with a substantial amount of personal autonomy and discretion over the procedures to be followed and the scheduling of their time on the task.
- High-tech employees enjoy getting feedback on job performance from the job itself,

in other words, their own tangible outputs. They seem to be better able to critique their own work than other employees and in fact prefer that to supervisory feedback or evaluation. They can be highly self-critical of their own creations or outputs.

They resist unnecessary constraints and controls on

their time, their professional judgment, their personal autonomy (freedom to move about) and their integrity.

In a nutshell, high-tech people tend to be energetic, ambitious, responsible, self-disciplined, careful, methodical, logical and outspoken "loners." They can work with others, but their satisfac-

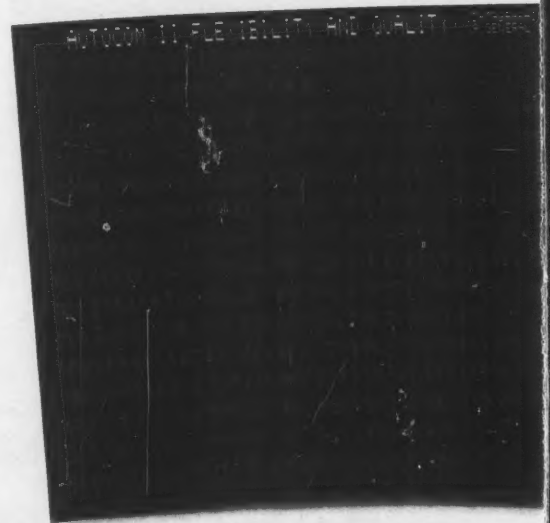
tion comes mainly from the job or task itself.

Managing these employees can be a trying experience for a manager who lacks a background in their disciplines or who does not share their qualities, values or mental disposition.

But is it any easier for the manager who has come up

through the ranks of their own disciplines? Probably not. It may even be more difficult.

The assumption that a truly great scientist, for example, can better supervise other great scientists does not seem to be borne out by research. The "loner" in a management role has a lot of lessons



WET OR DRY.

As an information management and retrieval system, computer output microfilm gives you control of massive amounts of information in a small amount of space. In fact, each microfiche can contain up to 288 times more data than a printed computer page.

For almost 30 years, companies have been turning to DatagraphiX for their COM needs. Because our systems give them a return on investment that simply can't be equalled

by other methods of output. A minimum of 35% should be attained in the first year alone. Plus, we give you something other COM companies don't: choice.

Whether you want the archival benefits of wet process systems, or the convenience of dry process systems, DatagraphiX is the source to come to. Our AutoCOM systems are the world's most popular COM recorders — easy to use,



Their Unique Characteristics Is Half the Battle

to learn before he can become an effective supervisor.

The temptation to *do* (task orientation), rather than to supervise or review, is greater than it would be for the nonspecialist manager. And if information processing professional supervisors continue to *do* things, rather than delegate them, they

frustrate their high-tech subordinates.

The generalist can at least confess ignorance, but the specialist is supposed to know and knowing makes the specialist want to do. They also seem reluctant to let subordinates make mistakes.

The very talents and virtues

that bring specialists recognition and promotion may well get in the way of their effectively managing former colleagues and peers. Newly appointed high-tech managers must master a new set of skills if they are to succeed.

Skills in interpersonal communications, in delegation and in motivation of others

will be required.

You are supposed to be creating an environment in which your subordinates can realize their potential. Your satisfaction is now to be realized from seeing to their growth. If you do their work for them, you may be growing, but they are not. They are stymied.

The reward for the high-tech manager should be the knowledge that his subordinates are growing professionally. This calls for a mentor relationship with subordinates, not an adversarial or power-based relationship.

You aren't there to compete with your troops or to show off your genius. You can best serve their growth and job satisfaction needs if you have high expectations for their success and maintain a work environment that provides continuous challenge, task and skill variety and freedom from bureaucratic restraints.

The usual justification for treating high-tech people like children is that their behavior at times seems childish — petulant, withdrawn and supersensitive to criticism. But those childish characteristics are understandable when one considers that high-tech employees behave that way because they have not lost their adolescent wonder and curiosity.

Everything is amazing and amusing to them, except for convention. Convention is a block to creativity. Conventional wisdom has no merit to them. Convention says: "it can't be done." But they know better. Anything can be done or done better.

So the high-tech employee, in fact, is not so much childish as "childlike." They are the eternal students, always searching, always seeking, never satisfied with the status quo or with things as they are.

The prospect of managing a group of high-tech employees may seem difficult or impossible to managers conditioned by traditional notions of work behavior. The mailed fist must be replaced by the silk glove. Direction must give way to participation, involvement and negotiation.

Formalized planning and communicating may have to be given up for less formal arrangements. Delegation may have to be practiced by assumption of responsibility rather than by conferral. Control may have to be experienced by self-discipline rather than by impositions from higher authorities.

While the investment in the growth and development of high-tech employees is necessarily great, the return is likewise great.

Bologna is president of Odiorne International, Inc. in Plymouth, Mich.

ARIS II FLEXIBILITY AND QUALITY
DATAGRAPHIX, INC.
A GENERAL DYNAMICS SUBSIDIARY

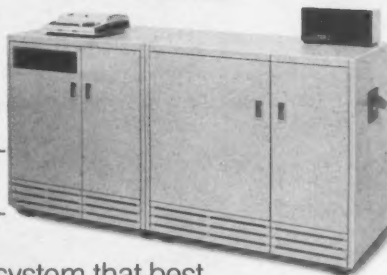
CLEAR-CUT ROI.

inexpensive to operate. In fact, we sell and service everything needed for total COM support. And now we've introduced ARIS II, a 12,000 LPM dry process recorder utilizing state-of-the-art laser imaging technology, multifont convenience, and the expertise of the people who invented COM.

At Datagraphix, you can pick the system that best fits your company's needs, and end up with a tailor-made solution that will yield the quickest, highest ROI.

For more information, call or write to us at Datagraphix. It's one of the wisest investments in time your company will ever make.

Datagraphix, Inc. Dept. 3515, P.O. Box 82449, San Diego, CA 92138, (800) 854-2045, Ext. 5581. In California call (714) 291-9960. Ext. 5581 TWX (910) 335-2058.



Datagraphix

The Computer Output Management Company
a General Dynamics subsidiary

Professional Ethics for DP Personnel

(Continued from Page 61)
the unique nature of any profession. Among other things, a profession is something of a distinctive culture with its own symbols, language, attitudes and customs. In addition, any profession develops values. As a distinct group with values, it needs to be concerned with the meaning of ethics for its members qua members of that group as opposed to any other group and as peers rather than inferiors and superiors.

The distinction between morality and ethics is, in the minds of many people, a cloudy one. Yet the distinction, as regards professional ethics, is central to the issue under discussion.

Morality has to do with norms of conduct and the approval of such norms. Those norms are external standards placed upon people to which conformity is required before approval is bestowed.

Codes and Ethics

Codes of conduct, then, fall under the heading of morality. Ethics, on the other hand, has to do with reflection upon conduct and evaluation of conduct as good or bad. Justification of moral norms, the nature of good and bad, evaluative arguments, levels of motivation, moral epistemology, theories of obligation and the like fall under the category of ethics.

It is within these categories, not just the category of a code of conduct, that any kind of professional ethics, including ethics for DP professionals, must concentrate its efforts if it is to be viable and usable within that particular profession.

Codes, though useful at times, are insufficient to encompass the complexity of ethical situations encountered by professionals, especially if managers seek to make the subordinates conform, in all ethical situations, to the codes and thus are often viewed by those subordinates as irrelevant or archaic.

To stress thinking about ethics as described above, however, is to encourage people to take seriously moral dilemmas and to seek to produce their own workable solutions.

Within any profession's ethics two arenas may be defined: personal ethics, which is reflection upon and evaluation of the conduct of individuals, and social or corporate ethics, which is reflection upon and evaluation of conduct of corporations.

Sadly, most professional ethics up to the present has emphasized the personal side of ethics to the neglect

of the social or corporate side. Yet any corporation that expects its employees to take personal professional ethics seriously must itself, prior to that expectation, take corporate professional ethics seriously.

For example, how can a company rightly expect its employees to lay aside racial prejudice during review proceedings while simultaneously investing in the ra-

cial injustice in South Africa?

In the words of Charles S. McCoy, Mark Juergensmeyer and Fred Turning in "Ethics in the Corporate Policy Process: An Introduction" (Berkeley: Center for Ethics and Social Policy, 1975), p. 3: "If we are really concerned about the quality of our world, we must go beyond individual ethics and develop ways to understand and improve the ethics of organi-

zations."

One caution is in order here. Virtually any company or profession, when asked, would assert that it contributes to the public well-being. That claim must be evaluated, however, in terms of the motive that lies behind the alleged ethical conduct. Was the conduct merely a type of window dressing intended to obscure the real driving force, that is, power or profit

or authority or monopoly? Or was it truly an action that grew out of a concern to improve the social situation?

Rightly motivated ethics will be concerned for society's trust and well-being as ends in themselves, not as a means to secure corporate or professional self-interests. To use a code of ethics as a means to promote self-interest is itself an abuse of that

(Continued on Page 68)

QUADBOARD™

THE FIRST AND ONLY BOARD YOUR IBM PC MAY EVER NEED.

Your IBM personal computer is a very versatile piece of equipment. Perhaps more versatile than you realize. New applications and functions are being developed every day. Now with Quadboard

by Quadram you can keep your options open for tomorrow's technology. Following in the tradition of Quadram Quality, four of Quadram's best selling IBM boards have been combined into one board. Your remaining slots will be left free and available to accommodate future expansion needs and uses which you may not even be able to contemplate today.

ACTUAL SIZE

PROVEN DESIGN.

Quadram has been shipping IBM boards with each of the Quadboard functions on separate boards since December, 1981. They are still available as separates (including a Dual Port Async Board) for those who desire a quality board but do not need to keep slots open for future expansion. And they all come with a one year warranty from the leader in technology applications.

256K MEMORY EXPANSION.

Socketed and expandable in 64K increments to 256K, full parity generation and checking are standard. A Quadboard exclusive feature allows parity to be switch disabled to avoid lock up upon error detection. The dip switches also allow it to be addressed starting on any 64K block so that it takes up only as much as it has memory installed. Memory access and cycle time naturally meet all IBM specifications.

CLOCK/CALENDAR

Quadboard eliminates the hassle of manually inputting the date on system boot up by providing for the clock and all software routines necessary for inserting the appropriate programs on your diskettes. The internal computer clock is automatically set for compatibility with most software routines which utilize clock functions. On-board battery keeps the clock running when the computer is off.

READER COMMENTARY/Nancy Twito Morris†

Tech Writers Identifiable by Their Sneakers

To be a good technical writer requires many skills. You must be able to determine what documentation is desired or required, which frequently resembles playing pin the tail on the (ahem) donkey.

You must be a quickdraw expert at answering: "What does a technical writer do?"

and carry in your briefcase justification for your existence.

You must have a Beckett of patience in order to work with people whose highest praise is: "You might even be a good programmer someday."

You must have the ability to generate high levels of

adrenaline to keep yourself awake while writing operating procedures.

You must have the gentle touch of a June breeze and the effect of a monsoon while editing analysts' work.

You must be able to humbly acknowledge your role as an uneducated orphan in a DP environment and chuckle

believably upon hearing, "Every shop needs documentation to keep the janitors in work" for the twenty-third time.

You must have Lord Peter Wimsey's tenacity to be able to translate programming "genius" into English. You must be as ruthless as a New York City cop while asking

questions. You must be willing to sacrifice your intellect, your integrity and your soul in arbitrating the writing of business requirement specifications.

I felt I met these qualifications, and so entered the field of data processing technical writing. It was not my first, second, third, fourth, fifth or sixth career choice, if you must know the truth.

Nevertheless, the salary range is higher than that for teachers and a typical workday allows me time to write letters, create and recreate shopping lists and sift through my schemes for the future (in other words, life after data processing).

Trouble of Late

Lately, though, I've been having trouble. Before leaving for work each morning, I take my temperature to make sure I'm not harboring a fatal flu virus; I inspect each of my car's tires — square inch by square inch — for slits that may render it unsafe; I return to the house several times to make certain the dogs have been fed and watered; and I appeal to my husband's sense of bravado by daring him to run off with me to Majorca. (He, having at the moment only small doses of the trouble I'm having, politely declines.) Ultimately, I go to work.

Once there, I stroll to my desk, "good morning-ing" and smiling along the way.

A tech writer generally has a liberal arts orientation and, among a run of programmers and analysts, is noticeably more outgoing than the norm. We've been given the task — albeit by default — of carrying the banner of human manners into the house of high technology.

Tech writers are easily recognized in a large data center by their sneakers — they match.

Morris lives in West Orange, N.J.

BY QUADRAM

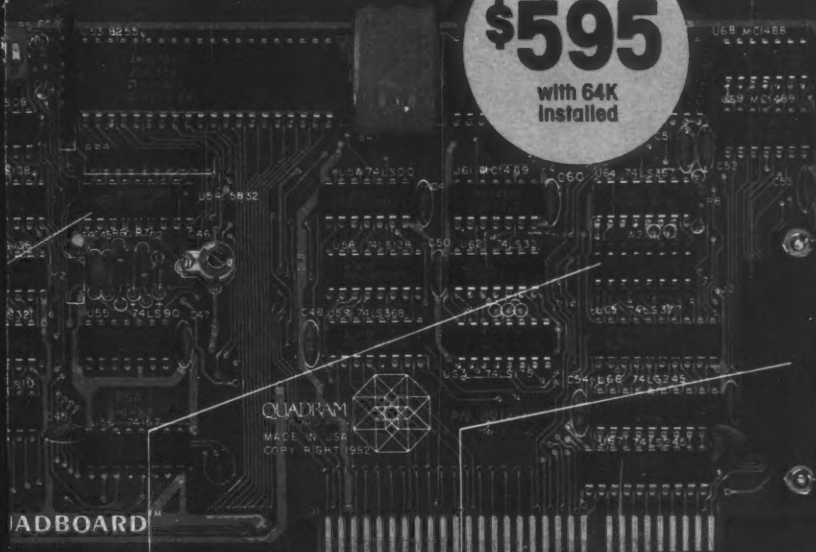
ALL ON ONE BOARD

Now you can utilize all the PC's capacity with Quadram's extremely flexible configurations. And it's totally compatible with IBM hardware, operating systems, and high level languages. It's a full-size board that can be inserted into any free system slot and it even includes a card edge guide for securely mounting the card in place.

SOFTWARE, TOO!

With Quadboard you receive not only hardware but extensive software at no extra cost. Diagnostics, utilities, and Quad-RAM drive software for simulating a floppy drive in memory (a super-fast SOLID STATE DISK!) are all part of the Quadboard package.

\$595
with 64K
Installed



PARALLEL PRINTER I/O.

A 16 pin header on Quadboard is used for inserting a short cable containing a standard DB25 connector. The connector is then mounted in the knock-out hole located in the center of the PC backplane. The parallel port can be switch disabled or addressed as Printer 1 or 2. No conflict exists with the standard parallel port on the Monochrome board. The internal cable, connector and hardware are all included.

ASYNCHRONOUS (RS232) COMMUNICATION ADAPTER.

Using the same chip as that on the IBM ASYNC board, the device is software programmable for baud rate, character, stop, and parity bits. A male DB25 connector located on the back connector is identical to that on the IBM Async Adapter. The adapter is used for connecting modems, printers (many letter quality printers require RS232), and other serial devices. Switches allow the port to be configured as COM1 or COM2 and the board fully supports IBM Communications Software.

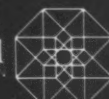
INCREDIBLE PRICE!

Priced at \$595 with 64K installed, \$775 with 128K, \$895 with 192K and \$995 with 256K.

ASK YOUR DEALER.

All products are sold through local personal computer dealers. If yours does not stock Quadram, please ask him to call us at (404) 923-6666.

QUADRAM
CORPORATION



4357 Park Drive, Norcross, Ga. 30093

**All U.S.
Sales/Use Tax Rates
on magnetic tape...**



Vertex Systems Inc.
990 Old Eagle School Rd., Wayne, PA 19087
215-687-9060

Hewlett-Packard on Data Processing ROI

**You're paying your EDP people 17%
to make them 500% more productive.**



more this year. But there's a way

That 17% isn't just an estimate. It comes from a survey of EDP departments across the country, taken by *Computerworld* in December, 1981.

There's nothing blue-sky about the second figure, either. That 500% gain in productivity was reported by Dick Hamilton, an independent contractor who develops programs for Weyerhaeuser Company. He's been able to write new applications 5 to 20 times faster, because the programmer productivity tools we've designed for our HP 3000 computer system are so efficient.

Programmers save time.

The 500% increase we mentioned is just one example. We've seen our tools deliver results like these time and time again. In every area of EDP activity. From outlining new projects in much less time, to eliminating countless numbers of programming steps, to cutting software maintenance costs in half.

But whether you spend 10 months or 10 days developing a new application, it's a valuable asset to your company. And clearly, the best way we can increase your ROI is to help you protect that software investment. That's why we design every new HP 3000 to be software compatible with all our earlier models. Which means you can upgrade to a newer, more powerful HP 3000, or add more systems to build a network. Without changing one line of code.

The whole company saves money.

Of course it's important to save money in your EDP department. But it's even more important to make the best possible use of your programmers so they can spend more of their valuable time developing special applications that save money across your entire company. And we have a long list of software tools which help them do just that.

To begin with, your programmers won't have to spend a minute designing applications for word processing, electronic mail, management reporting, or business graphics. We've got off-the-shelf software for all these functions.

Better yet, these user-friendly products make it

easy for people with no computer experience to generate management reports all by themselves. They can even produce presentation-quality full-color charts, graphs, and overhead transparencies. Without asking the EDP department for help.

To reduce the backlog even more, we have a number of sophisticated software solutions for accounting, materials management, production management and distribution/inventory control. Plus an aggressive third-party program that brings you over 260 applications designed by experts from a broad range of industries.

A new level of uptime.

You can't sustain an increase in productivity unless your systems are up almost all the time. In fact, ours are so reliable that in 1980 we introduced our Guaranteed Uptime Service. Which states, in a nutshell, that if your HP 3000 system is up less than 99% of the time over a three-month period, your next month's service contract on all covered items is absolutely free.

To give you this new level of uptime, we give you a total commitment to service. We're sure that's a large part of the reason why HP was ranked #1 for support satisfaction in a recent Datapro survey of 2309 EDP departments. And why our list of 9000 satisfied customers keeps getting longer every day.

We've pulled it all together.

When you take the long view, we're talking about a lot more than EDP budgets, applications, development, hardware reliability, or customer service. What we're offering is a broad approach that uses the power and flexibility of our HP 3000 to run your data processing, office automation, and application development programs. And ties them all together into one efficient, information management network.

We've put together a brochure that can tell you a lot more. It's called Information Management Systems. Just ask your local HP sales office for a copy. Or write John Celii at Hewlett-Packard, Dept. 03141, 19447 Pruneridge Avenue, Cupertino, CA 95014.



**HEWLETT
PACKARD**

Rethinking Ethics for DP Professionals

(Continued from Page 64)

trust and thus constitutes ethically despicable action. Presuming, however, that the motive was honorable and that the company or profession does have a legitimate social concern, it then can pursue personal professional ethics among employees or members and remain ethically consistent.

The notion of motive should be at the heart of professional ethics. What is it that should motivate DP professionals to engage in right action, however defined, and how can that motivation be encouraged? The common motivation behind a code is fear of punishment for noncompliance and hope of reward for outstanding behavior.

Parker defined these punishments and rewards in financial and promotional terms. Yet this level of motivation is among the lowest. It is the kind of motivation we employ in dealing with little children. We give them standards of conduct with attendant promises of reward and punishment for compliance or noncompliance, respectively.

When children get older, however, we explain the rationale behind the standards. As they continue to mature into adulthood they are encouraged to internalize morality, that is, to develop for themselves convictions regarding right and wrong and legitimizing arguments behind those convictions.

Morality is no longer legislated by

parents. Similarly with professional ethics, to impose a code upon adults, and highly trained professionals at that, is to insult both humanity and the professions. Rather, people should be treated with dignity. Professional ethics must be internalized. Appeal should be made to such notions as character, responsibility, professional goals, corporate and social consequences, honor, justice, consideration and love.

To develop professional ethics among DP personnel is to encourage, through reading and discussion, thinking about the impact of responsibility, character, values and professionalism on the working situation. It means to enable people to resolve for themselves ethical conflicts and

to be able to defend rationally their resolutions in a way that comports with human dignity.

Concurrent with the efforts at motivation should be the opportunity for dissent. Part of respect for human dignity is the allowance for divergent opinions. While sensitizing professionals to ethical concerns, the corporation must become vulnerable enough to accept and entertain criticism. Only in so doing will it earn the respect and trust of employees.

In summary, then, we must keep in mind four ideas when attempting to develop ethics within the DP profession. Codes and rules should be de-emphasized.

Threats and promises, an external motivation for ethics, are an insult to human dignity. Corporations and professional groups must demonstrate a consistent, commendable social ethic out of a concern for societal well-being before expecting employees to demonstrate commendable personal professional ethics.

Finally, motivation must come through appeal to internal ethical qualities and convictions. When these ideas are central to thinking about professional ethics, then professionals will become more serious about ethics.

Wozniak, who holds a doctorate in social ethics, is currently working as a systems analyst at City National Bank's computer center in Los Angeles.

Now you can do things with your IBM computer that you've always wanted to do.

Things that will solve your end users' problems. And yours. Without changing your existing IBM environment.

Your hardware, our software

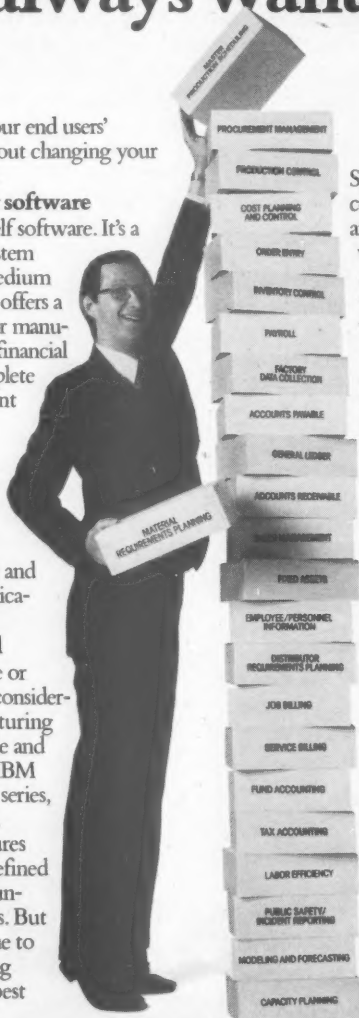
Spectra is our off-the-shelf software. It's a fully-integrated, on-line system developed by Xerox for medium to large IBM computers. It offers a full range of applications for manufacturing, distribution and financial functions. As well as a complete line of software management support systems.

With Spectra, you can avoid years of development and have a system up and running in a few months. You simply phase it into your existing environment and start cleaning up your applications backlog.

You stay in control

Spectra is ideal for single or multi-plant environments considering a closed-loop manufacturing system. It's fully compatible and upgradable with installed IBM CPUs as small as the 4300 series, all the way up to the 3081.

It's proven, too. Its features have been enhanced and refined through years of use by hundreds of satisfied customers. But that's not all. We'll continue to update the system, ensuring that you always have the best software available.



Two ways to get there

You can get the benefits of Spectra by using it on your IBM computer immediately. Or, as an option, start with the same software on our on-line, remote computer services. Then, when you're ready, just move the software and data base in-house.

We'll get you up and running with a comprehensive training and implementation program. After that, we'll always be on hand to help in any way we can.

To find out more about Spectra software, call toll-free (800) 323-2818, Operator 146. In Illinois, call (800) 942-1166.

Or return this coupon. We'll mail you our new *Spectra Capabilities* brochure. And you'll be on your way to doing the things you've always wanted to do with your IBM computer.

Xerox Computer Services

c/o Ron Rich, 5310 Beethoven Street
Los Angeles, California 90066

Send me your *Spectra Capabilities* brochure. My company is a:

☐ Manufacturer ☐ Distributor

I'm interested in your software for:

☐ IBM 43XX ☐ IBM 370 ☐ IBM 30XX

Name/Title _____

Company _____

Street _____

City _____ State _____

Zip _____ Tel. () _____

C9/13

XEROX

XEROX® and Spectra are trademarks of the XEROX CORPORATION.

Analyzing Micro Prices

(Continued from Page 61)

and developer/author for both hardware and software. For both, the list price, cost of goods, gross margin, cost of sales and profits are displayed. The assumptions underlying the cost of goods as a percent of unit list price for each participant in the sales cycle are as follows:

	Hardware	Software
Retailer	70%	65%
Distributor	50%	45%
Manufacturer/ Publisher	20%	10%

The cost of sales as a percent of unit list price assumes:

	Hardware	Software
Retailer	20%	20%
Distributor	10%	13%
Manufacturer/ Publisher	15%	26%

The analysis leads to the conclusion that the before-tax profit rates for the hardware and software would be 30% for the hardware manufacturer and 20% for the software publisher, after deduction of the author's royalty. The profits generated by the retailer and distributor, however, may have to be compromised by competitive discounting and large purchase deals, both of which are common.

The conclusion is the difference in absolute value between the total profits generated from hardware and software. The model shows that profits from hardware are almost a decimal order of magnitude greater than those generated from software. Shouldn't this drive the software company into the hardware business to get a share of the rewards?

Frank is executive vice-president of Informatics General Corp. in Woodland Hills, Calif.

Remote Management System For Execs Based on 'Mapper'

BLUE BELL, Pa. — Sperry Univac has announced a remote management service for corporate executives based on its Mapper applications development system.

The service will be based on a management-oriented utility — using the Mapper system — from an Executive Information Service Center here. The Executive Information Service was designed to bridge the gap between operational information from traditional DP sources and true executive information needed for executive decision-making.

Available via a telephone-linked CRT terminal, the service enables users to "become the architects and users of their own personal information network," according to the vendor.

With a minimum monthly fee of \$500, Mapper software costs \$250/mo with a \$20/mo usage charge, \$7 per 1,000 I/Os, 7 cents for storage of 1,000 line/day, \$20/station registration fee and \$10/report registration fee. Univac can be reached through P.O. Box 500, Blue Bell, Pa. 19424.

Datacom/DB Release Gets Index Management

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) has added index management capabilities with Release 7.3 of its Datacom/DB, a multithreaded data base management system (DBMS) for IBM OS/VS and DOS/VS(E) sites. Datacom/DB is the underlying DBMS for ADR/Datacom.

The major enhancement in Release 7.3 is the Relational Index System (RIS), which reportedly balances free index space without the need for traditional bit maps or block chains. These techniques permit more efficient free-space management, ADR said.

RIS reduces CPU requirements and I/O events by one-third to one-half, ADR claimed.

Other enhancements to Datacom/DB include the ability to support up to 999 data bases and their associated indexes; an additional user program entry point, which includes services to improve performance and enhance audit trails and security capabilities; device support for IBM 3375 and 3380 disk drives; and improved dump and statistical file handling, the vendor said.

Release 7.3 is available with ADR/Datacom. The permanent license price for Datacom/DB starts at \$66,200 for OS sites,

\$54,600 for DOS and \$41,000 for operating systems that run on the IBM 4321, 4331, 370/115, 370/125 and 370/135. ADR is based at Rt. 206 & Orchard Road CN-8, Princeton, N.J. 08540.

Inventory Aid Out for IBM

JERICHO, N.Y. — Computer Associates International, Inc. has taken its first step into the applications software market with an on-line inventory control and distribution management program for IBM and plug-compatible mainframes.

CA-Prisms is adaptable for use by manufacturers, wholesalers, retailers or any organization with a finished goods inventory, its vendor said. Its integrated on-line modules reportedly include order processing, mail order processing, inventory control, purchasing, bill of materials, sales analysis, accounts receivable, accounts payable, general ledger, management inquiry and reporting, security access and a user report generator.

A perpetual CA-Prisms license costs \$85,000, Computer Associates said from 125 Jericho Tnpk., Jericho, N.Y. 11753.

Hero 2.0 Supports All MVS Versions

SUNNYVALE, Calif. — A program development system that was introduced about a year ago as a replacement for IBM's TSO has reportedly been enhanced to work with all currently available versions of MVS.

The Software Authority, Inc. has revised its original Hero system to produce a second release that supports MVS in both its free and for-fee versions, including MVS/SP 1.1 and SP 1.3. Hero 2.0 thus works in a wider range of IBM environments than Hero 1.0, whose MVS support is limited to the operating system's free version, Release 3.8, a Software Authority spokesman said.

Differences

Unlike the original Hero offering, Version 2.0 also supports IBM's System Network Architecture (SNA), Synchronous Data Link Control (SDLC) protocol and the Model 3767 dot matrix printing terminal in both the SDLC and start/stop modes.

Trial copies of Hero 2.0 are now being made available to interested users on a first-come, first-serve basis. The "no-strings" trial offer allows prospective buyers to test the latest Hero release free of charge for 30 days, the spokesman said.

Interested users can qualify for the offer merely by providing The Software Authority with their CPU serial number and operating system release number.

Except for its expanded software and communications support, Hero 2.0 provides basically the same features and capabilities as the original release. Both versions are intended primarily for medium- and large-scale IBM or IBM-compatible data centers that currently use TSO but find it overly hogish of systems resources [CW, Aug. 31, 1981].

Like the original Hero version, Release 2.0 allows, for example, an IBM 3033-class processor to support 250 to 400 concurrent programmers, compared with 60 to 80 program-

mers for TSO, the spokesman said.

(Continued on Page 70)

Exec Sees IBM Succeeding In MVS-for-Fee

By Jeffrey Beeler

CW West Coast Bureau

SUNNYVALE, Calif. — IBM is succeeding in its efforts to encourage MVS users to migrate from the free to the for-fee versions of its popular batch-oriented operating system.

That conclusion comes from The Software Authority, Inc.'s President David Alderman, who bases his opinion on the results of a recent survey that shows MVS users increasingly converting from the system's free versions to its SP versions.

Alderman and his colleagues earlier this year obtained from a market research company a magnetic tape listing 1,500 MVS sites around the U.S. and tried to survey as many of the installations as possible by phone. Of the 980 sites that responded, almost 80% described themselves as users of one or another form of either MVS/SE or MVS/SP, Alderman said.

The survey also revealed an "overwhelming" user preference for the latest of IBM's MVS releases, MVS/SP 1.3, Alderman said.

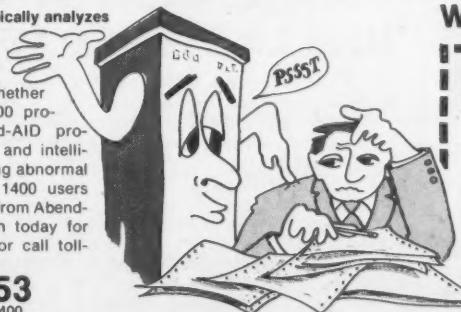
If the trend toward MVS/SP 1.3 continues at its current pace, most of the DP installations that participated in Alderman's survey will convert to the latest MVS release within the next six months, he predicted.

"What these findings mean is that IBM has fared very, very well in its attempts to woo people away from the free versions of MVS," Alderman said. "IBM's success in convincing its customers to buy its MVS releases will give the company a little more control over its own destiny."

When your program cancels, the computer is trying to tell you something. With DOS Abend-AID, it can.

DOS Abend-AID automatically analyzes your abends and tells you, in English, what happened, why and where it happened. Whether your shop has 1 or 100 programmers, DOS Abend-AID provides the most efficient and intelligent approach to handling abnormal job terminations. Over 1400 users worldwide are benefiting from Abend-AID. Return the coupon today for additional information, or call toll-free:

800-521-9353
In Michigan, call: 313-540-0400



COMPUWARE

COMPUWARE CORPORATION • 32100 Telegraph Rd • Birmingham, MI 48010

Please send information about DOS Abend-AID to:

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

PHONE () _____ OPERATING SYSTEM _____

Speed Updates, Testing Packages Boost CICS Performance

NEW YORK — A series of four software packages that are said to boost IBM CICS systems performance, speed updates and applications programs testing and increase program-

mer productivity by as much as 300% is being marketed here by Loris Data Associates, Inc.

Eazy/CICS products allow applications and systems programmers to

look into the CICS and OS environment as well as update CICS without bringing the systems down, according to the vendor.

Eazy/Find is a transaction package designed to aid systems and applications programmers develop and debug programs. It costs \$7,000.

Eazy/Table is a table-building module that reportedly permits CICS users to add new entries to the CICS tables (PPT, PCT, FCT) without interrupting the use of the system. It sells for \$5,000.

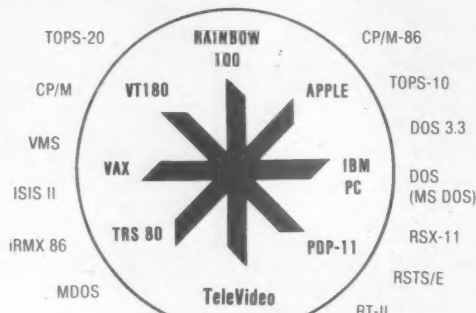
Eazy/Browse enables inquiry, update and search/scan of any file within the CICS environment with immediate visual verification that a file has been updated correctly. It alleviates the wait for batch printouts or the development and run of cumbersome computer-interrupting programs, according to the vendor. It also permits instant forward and backward paging and addition and deletion of records. It is priced at \$6,000.

Finally, Eazy/Map is a package used in Basic Mapping Support, which provides a method for generating maps. The programmer need only fill out an 80-col image that describes the appearance of the screen. Eazy/Map is priced at \$2,500.

Loris Data Associates is based at 401 Broadway, New York, N.Y. 10013.

COMMUNICATIONS SOFTWARE

Give your personal computers error free communications with your corporate computer or with each other - mix and match.



Communicate with us.
polygon associates, inc.
9 American Industrial Drive, St. Louis, Missouri 63043
314/576-7709 TWX 910/764-0876

Release 4.0 Of Corodale Tool Aids IBM Users

BOSTON — Corodale, Inc. has announced Release 4.0 of its System/Manager software package for users of IBM DOS/VS(E), adding several enhancements to its three components.

The first of these components is Space/Manager, which reportedly offers simplified space allocation for fixed-block architecture devices. It also enables file space to be calculated automatically in terms of the space requirement of another specified file, simplifying the allocation of work files.

The Tape/Manager enhancements offer a new Tape Vault Management system, which reportedly enables DOS/VS(E) users to maintain a complete inventory of their tapes and their physical location in vaults.

Job Control Language/Manager has been enhanced by the addition of two options: a Power interface and Symbolic JCL.

The Power interface reportedly reduces operator intervention and optimizes scheduling by permitting Power/VS or VSE/Power commands in the JCL of a System/Manager job stream, the vendor said. The Symbolic JCL facility removes much of the need to change JCL either for testing or in production. With Symbolic JCL, symbolic variables are used within the JCL stream instead of file names and devices, according to the vendor.

Release 4.0 of System/Manager costs \$7,500 to \$22,000, depending on configuration. Corodale is based at 211 Congress St., Boston, Mass. 02110.

'Fieldwatch' Gets Tracking Aids

BURLINGTON, Mass. — Data, Inc. has added two tracking products to its Fieldwatch software. The software runs on IBM 370, 4300 and 30 series mainframes and on processors from Datapoint Corp., Prime Computer, Inc. and Data General Corp.

The Saleswatch system tracks sales leads through the selling cycle and monitors salesman performance. The package can also monitor salesman's day-to-day whereabouts and handle electronic mail, the vendor spokesman said.

Shopwatch tracks internal plant-equipment outages, plant-maintenance people and vendors. It also tracks meantime between failures, vendor response time, equipment history and preventive maintenance, the vendor said.

Saleswatch ranges in price from \$50,000 to \$150,000, while Shopwatch costs between \$50,000 and \$130,000, a spokesman said from Data, One New England Executive Park, Burlington, Mass. 01803.

'Hero 2.0' Supports MVS Versions

(Continued from Page 69)

The two releases also reportedly use basically the same full-screen editor, global editor, command procedure language and interactive document preparation aid, the source added.

To make Hero 2.0 readily testable in a TSO environment, The Software Authority designed its product to support TSO user-identification and data-set naming structures. The twin support features reportedly enable Release 2.0 to satisfy a TSO shop's

user-identification and data-set naming needs without requiring any software conversion.

Prices for the latest Hero release vary with a user's CPU size. For IBM 4331-2 or equivalent processors, the development system costs \$27,000; for IBM 3081-class machines, \$48,500.

Both Hero 1.0 and 2.0 are available from The Software Authority at 1270 Oakmead Pkwy., Sunnyvale, Calif. 94086.

IBM

A Library Control System For CMS

- Supports multiple users.
- Offers control and synchronization of source data from development through production.
- Saves space by keeping a base module plus updates.
- Prevents duplication through tracking usage by program and user.
- Provides complete auditability of changes to source code.

Features

- Requires no modifications to install.
- Provides complete audit trail.
- Stores data in compressed format.
- Includes cross-reference of COPY/INCLUDE members.
- Provides comprehensive reports with history and status of source members.
- Handles programs, EXECs, JCL or any source data.
- Offers optional automatic job or EXEC submission to other virtual or real machines.
- Provides security on program, user, or function basis.

Name _____
Title _____
Company _____
Address _____
City, State _____ Zip _____
CPU _____ Phone _____

VM

Software Inc.
P.O. Box 985 • Vienna, Va. 22180
(703) 821-6886

TIS

HIGH PERFORMANCE RELATIONAL TECHNOLOGY NOW AVAILABLE FOR LARGE SCALE USERS

Now, integrated data base technology combines relational view and relational structure with high performance. TIS, from Cincom Systems.

TIS. An entirely new architecture to handle your most demanding information requirements today—and the new wave of data processing innovations to come.

TIS LUV. Insulating programs from change.

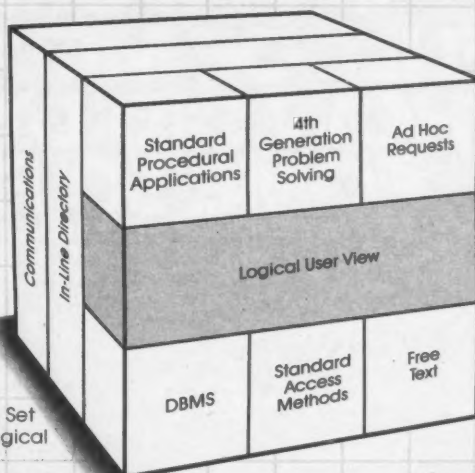
TIS. The next generation of software. Set apart from ordinary systems by its Logical User View (LUV) component.

LUV provides a relational view of data. So that your programs are insulated from the DBMS, the data structures, the accessing strategies, and the physical environments. Users do not need to know navigation requirements or file types.

Using just four verbs, "GET," "INSERT," "UPDATE," and "DELETE," two-dimensional relational views are delivered to users.

As a result, LUV simplifies and speeds application development, both for professional programmers and end-users. And most important, there is no need to alter programs as changes occur in hardware, software, or in the way data is stored or accessed.

Also, by insulating user interfaces from the physical environment, LUV simplifies the use of high level facilities—the sophisticated TIS Query, the TIS 4th Generation appli-



cation development system, and the TIS program generator.

TIS In-Line Directory—the power behind LUV.

Providing the intelligence for LUV is the In-Line Directory, the central brain and driving force of TIS. The Directory integrates all activities of the system. And it provides LUV with descriptions of the physical and logical views of the data. As well as the mapping that takes place between them.

TIS LUV. Relational technology to satisfy the most discriminating and

demanding large scale user. Providing a common view of data for your programmers, DBA, and end-users. Protecting your investment in application logic.

And if you're one of Cincom's 5,200 current DBMS users, there is another major advantage. TIS is closely compatible forward from our complete line of DB/DC systems software products. This way, if you are not yet ready for fully relational technology, you can start with TOTAL® and grow forward.

For more information on TIS and Cincom's full line of systems and application software, contact our Marketing Services Department.

800-543-3010

IN OHIO: 513-661-6000 IN CANADA: 416-279-4220

Clearly the leader in data base and software technology.



Cincom Systems

2300 Montana Ave. Cincinnati, OH 45211

Accounting Aids Out for 370, 4300

MINNEAPOLIS — A series of packaged general accounting and operational software for the IBM 370 and 4300 series of computers has been unveiled here by Lawson Associates, Inc.

The software incorporates 10 applications including

Vtam Support For IBM Printers Gets Update

DALLAS — LRS, Inc. has announced Release 3.0 of its IBM Vtam Printer Support System (VPSS) said to provide remote job entry print facilities for IBM 326X and 328X printers.

Release 3.0 is said to support any number of printers from a single address space running the JES 3270 Vtam or Tcam started task. The printers may be locally attached or remote, operating under any combination of bi-synchronous and Synchronous Data Link Control protocols.

Release 3.0 is free to users. A perpetual license for VPSS under JES II or JES III is priced at \$9,500, with rentals and leases available.

LRS can be reached through P.O. Box 18538, Dallas, Texas 75218.

Data Dictionary Fits System/34

SAUSALITO, Calif. — Positive Results, Inc. has announced a data dictionary for the IBM System/34.

Wizard One is said to meet data base management needs through planning, documenting and controlling records in a system. The menu-driven package reportedly requires 26K bytes of memory.

The software can be licensed for \$485/CPU and includes a 30-day money-back guarantee. Multiple-CPU discounts are available, according to a spokesman. Positive Results is located at 37 Willow Lane, Sausalito, Calif. 94965.

general ledger and report writer, accounts payable, accounts receivable, purchase order, fixed assets, payroll, personnel, order entry, inventory control and equipment and vehicle maintenance. Each module reportedly can be installed separately or can be used with any other module.

Accounting controls, audit trails, prompting and edit checks have been built into

this system to ensure accuracy, according to the vendor.

The software is written in structured Cobol and reportedly uses IBM standard CICS, Vsam and DOS operating systems. The 10 modules range in price from \$14,000 to \$50,000, and the entire bundle is available for \$160,000, Lawson said from Suite 390, 2021 E. Hennepin Ave., Minneapolis, Minn. 55413.

Utility Measures Response For IBM 3270-Type Units

LAKE HOPATCONG, N.J. — The Matlen Silver Group, Inc. has announced a utility that reportedly measures live performance in the IBM CICS environment, provides data compression to reduce line traffic and measures response time for IBM 3270-type terminals.

The Line Utilization Control Inquiry (Luci) System is said to be especially cost-effective for users with medium to large remote networks (35+ terminals) running under IBM DOS or OS environments with CICS/VS and Basic Mapping support.

The system costs \$8,850/site, with a \$1,000/site annual maintenance fee. A free 10-day trial period can be arranged with Matlen, 39 Woodlawn Terr., Lake Hopatcong, N.J. 07849.

IN A WORLD FULL OF MEDIA HYPE, HOW DID DYSAN COME SO FAR SO QUIETLY?

Or so fast? We didn't become a \$100 million-plus company in less than nine years by producing just any magnetic media. We did it by making the best. The best in disc packs. In single rigid discs. In disc cartridges. In diskettes. And in mini-diskettes. Many major OEM's have recognized the difference that Dysan quality can make. And have endorsed it with their own private label.

Today, there are sales offices and distributors in the United States and

throughout the world, selling and servicing Dysan precision magnetic media to OEM's, end users and retail outlets. If our media was just like everyone else's, we never would have come this far this fast.

Precision magnetic media from Dysan. Our media says it all. For the location of the Dysan sales outlet nearest you, contact Dysan at (408) 988-3472 Toll Free; (800) 538-8133 Telex; 171551 DYSAN SNTA TWX: 910-338-2144

Dysan Corporation, U.S. Sales Offices:

CA: Los Angeles (213) 907-1803, Orange County (714) 851-9462, Sacramento (916) 966-8037, San Francisco/Sunnyvale (408) 727-9552, DC: Washington (703) 356-6441, GA: Atlanta (404) 952-0919, IL: Chicago (312) 882-8176, (800) 323-5609, MA: Boston (617) 273-5955, (617) 229-2800, MI: Detroit (313) 525-8240, MN: Minneapolis, (612) 814-7199, MO: St. Louis (314) 434-4011, NY: New York (212) 687-7122, OH: Cleveland (216) 333-3725, PA: Pittsburgh (412) 261-0406, Philadelphia (609) 939-4762, TX: Dallas/Ft. Worth (817) 261-5312, WA: Seattle (206) 455-4725.

*Includes OEM Sales

Dysan Magnetic Media is also available Worldwide:

Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, Colombia, China, Denmark, Ecuador, Finland, France, French Polynesia, Greece, Guatemala, Hong Kong, Iceland, India, Israel, Italy, Ireland, Japan, Korea, Malaysia, Martinique, Mexico, Netherlands, New Zealand, Norway, Peru, Philippines, Puerto Rico, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, Uruguay, Venezuela, Western Germany.

Dysan Flexible Diskettes are also available from all Computerland Stores, Sears Business System Centers, and many independent computer outlets nationwide.

VISICALC ON IBM 34/38?

Call for details about
FPI-3 'Electronic
Worksheet' Financial
Modelling System

FUSION PRODUCTS INTERNATIONAL
415-281-1340 Telex 176-089 FUSION MLV

*Visicalc is a registered trademark of VisiCorp.
FPI-3 is a trademark of Fusion Products
International.
VisiCorp is in no way associated with FPI-3.

Version 1.1 of 'Vsamcomp' Out For IBM OS and DOS

NEW YORK — Micromax Computer Intelligence, Inc. has announced Version 1.1 of Vsamcomp, its Vsam Cluster Comparison utility for use in both IBM OS and DOS environments.

The user of this product is provided with extensive diagnostic information and formatted detail and summary reports, reportedly enabling him to prevent potential production problems and improve maintenance productivity. The product is planned to support all future Vsam versions of IBM and takes minutes to install.

The perpetual license fee for Vsamcomp 1.1 is \$3,000. Micromax is based at 55 John St., New York, N.Y. 10038.

For OS, DOS Environments

Cobol Task-Tracking System Bows

SKANEATELES, N.Y. — A Cobol task-tracking system for IBM OS and DOS environments has been announced here by Energy-Tek Software.

The Quik Project Control System (QPCS) reportedly features automated Gantt chart tracking on two different time scales and allows many users to utilize the same system to track their

tasks without interfering with each other. It also features bar charts, the vendor said.

An activity history file is automatically posted as a by-product of updating the project record, according to the vendor. This feature allows the user to allocate activity by cost center or type of activity for management information concerning resource

use.

QPCS will be available for shipment Oct. 15. The Cobol DOS and OS perpetual licenses are \$4,100 and \$4,800, respectively.

Energy-Tek Software is located at 16 Academy St., Skaneateles, N.Y. 13152.

'Map-Print' Documents CICS Code

OMAHA, Neb. — Consolidated Business Systems, Inc. is offering a program for creating screen documentation from IBM CICS Map Source Code.

Called Map-Print, the package prints the screen as it appears on a CRT screen. Text may be printed with screen through option cards, which the programmer embeds in the CICS Map Source Code, the vendor said.

The package costs \$20/mo on a one-year lease or \$1,200 for a perpetual lease, the vendor said from the firm located through P.O. Box 6183, Omaha, Neb. 68106.

Compiler, System Fit System/38

HOUSTON — Communication Controls, Inc. has released an IBM System/38 Source File Compiler and an Electronic Message Sending and Retrieval System.

The Source File Compiler features automatic compilation of Control Language and RPG problems and physical, logical, display and printer files from as many as six source files, one source file at a time, the vendor said.

The Message Sending System reportedly features local and remote message capability with application password security.

A license for Source File Compiler costs \$375 and for the Message Sending System, \$750, a spokesman said from 6606 Long Drive, Houston, Texas 77087.



Dysan
CORPORATION

Our Media Is Our Message

5201 Patrick Henry Drive
Santa Clara, CA 95050



'This is a Stickup!'

CPMS® - CICS SPOOL DISPLAY & PRINT

NEW

- Automatic & selective report printing
- Standard FCB Forms Control
- Route reports to any CICS printer
- Reduces need for RJE and couriers
- Display batch reports on CICS 3270s
- Reduces printing costs
- VSI, MVS, CICS/VS, JES I, JES II
- No modifications to SCPs or appls.

Site license under \$5,000 until Nov. 30, 1982

H & W Computer Systems, Inc.
P.O. Box 4173

Boise, Idaho 83704 • (208) 377-0336

Version 3 of VAX/VMS Gets Adabas-M Support

RESTON, Va. — Software AG of North America, Inc. has announced that Adabas-M, its implementation of the Adabas data base management system (DBMS) for the Digital Equipment Corp. VAX-11 series of superminicomputers, has been enhanced to include full data base support of the recently announced Version 3 of DEC's VAX/VMS operating systems.

Adabas-M is a dictionary-driven DBMS utilizing inverted/relational technology, according to the vendor. The reentrant multithreaded Adabas-M nucleus reportedly runs as a detached process under the VAX/VMS operating system. The en-

hanced version includes support for the VAX-11/730 hardware and software and enhanced buffer handling and error logging.

This product is available for \$40,000; it can also be rented on a monthly or yearly basis. Further details are available from Software AG at 11800 Sunrise Valley Drive, Reston, Va. 22091.

Control System Runs on Primos

HAUPPAGE, N.Y. — A manufacturing management and control system designed for manufacturers with 70 or more employees is available from Gull Resource Management Systems, Inc. The package runs under Primos, the operating system for Prime Computer, Inc.'s Information family of minicomputers.

The manufacturing management and control system is menu-driven, includes financial modules and was designed for the multiterminal environment. It includes Materials Resource Planning, Shop Floor Control, Inventory, Sales Order, Purchasing and other modules.

The package costs \$66,000 from Gull at 100 Pkwy. Drive S., P.O. Box 9400, Smithtown, N.Y. 11787.

Generator Added to Info

WALTHAM, Mass. — Henco Software, Inc. has introduced an automatic documentation generator as an extension to Info, the firm's relational data base management system.

Info-Flow reportedly uses a series of menus to take users through the creation, generation and updating of documentation. The software includes cross-referencing and narrative reports on the system, data files, programs, reports and input forms.

Info-Flow is available on Prime Computer, Inc. systems and costs \$5,000 from the vendor at 100 Fifth Ave., Waltham, Mass. 02154.

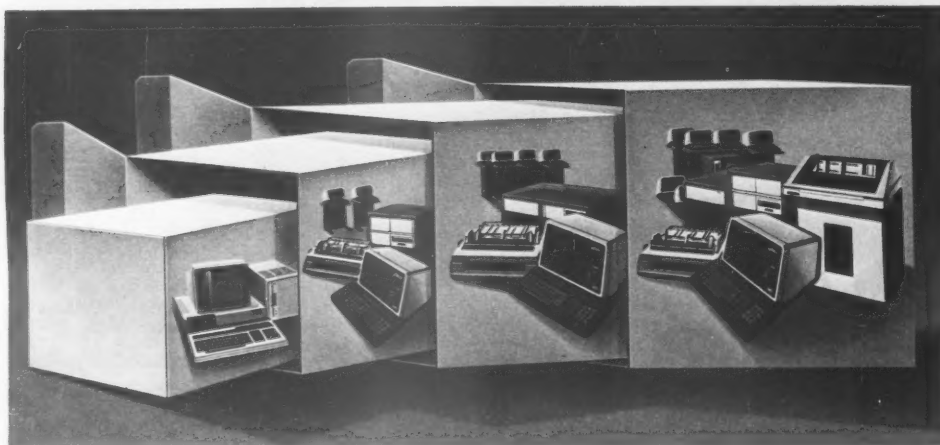
Software Standard Covers Documentation

ESTILL SPRINGS, Tenn. — A new software documentation standard said to provide a basis for lower software life-cycle costs has been introduced here by Associated Technology.

This standard covers all elements necessary for documentation of a detailed software design, according to the vendor. Included is information for documentation of structured program designs, data bases, external interfaces and quality-assurance provisions.

The standard is intended for software designers, documentarians, quality assurance, management, technical users and contract administrators. It costs \$27.

Associated Technology is located at Rt. 2, Box 448, Estill Springs, Tenn. 37330.



YOUR NEC COMPUTER GROWS WITH YOU.

NEC's Astra™—the expandable business computer.

Be certain that the business computer you buy to solve your problems today won't add to your problems tomorrow.

With the NEC Astra Series, as your business grows, you can expand from a single user desktop version all the way up to a powerful 16-station system. Yet the software which solves your business problems, from financial modeling to general accounting to word processing, remains the same.

Regardless of your company's size, we have a reliable, innovative business computer system to satisfy your present as well as future needs. Solutions that don't burst at the seams as your company grows. That's the NEC commitment, a commitment which has helped make NEC one of the world's largest computer companies.

Start your growth process. See a demo now.

To talk about where you're going, and how NEC can help you get there, return the coupon to NEC Information Systems Inc., 5 Militia Drive, Lexington, MA 02173.

Astra is a trademark of Nippon Electric Co., Ltd.



☐ I want to see a demo of the NEC Astra.
☐ I want more information on the NEC Astra.
NEC Information Systems, Inc.
5 Militia Drive, Lexington, MA 02173

NEC
NEC Information Systems, Inc.

Name _____
Title _____
Company _____
Address _____
City, State, Zip _____
Telephone _____

CW9132

The Benchmark in World Class Computers

Spreadsheet Software Out For IBM Series/1 Users

SAN FRANCISCO — H&B Computer Systems, Inc. has introduced electronic spreadsheet software for IBM Series/1 users. Called Calc/1, it features a 254-row by 63-col worksheet designed for business managers without prior computer experience.

The software enables users to scroll

JEM Tools Fit IBM's EDX

HERNDON, Va. — A Program Development Environment (PDE) package designed to encourage the use of modular programming techniques and linked subroutines in the IBM Series/1 EDX operating system environment has been announced by JEM Associates, Inc.

The program development tools reportedly provide automatic generation of the required \$EDXLINK or \$Link control data sets. They also provide maintenance of Autocall libraries, including automatic allocation and truncation of the object data set and update of the \$Auto data set.

PDE is said to be fully integrated into the EDX session manager. A one-time license fee costs \$750 from the firm at 459 Carlisle Drive, Herndon, Va. 22070.

Package Directs Goods Shipment

WALTHAM, Mass. — Shycon Associates, Inc. has announced Logistek-Europe, a package that can be used to facilitate shipping goods through Europe.

Said to run on any processor using a Cobol or Fortran compiler, the package incorporates information about European Common Market agreements that increase free trade across country borders. Items addressed include transportation, warehousing and inventory costs, currency exchange rates, raw material imports, transfer pricing, taxes and other inputs, the vendor said.

Packages cost between \$30,000 and \$300,000 depending on the level of sophistication. Most packages are customized, a spokesman noted.

Shycon is located at 1 University Office Park, Waltham, Mass. 02154.

Realtor Tracking Aid Runs on Wang Minis

CHICAGO — A real estate investment performance tracking tool that runs on the Wang Laboratories, Inc. 2200 series minicomputer is available from Shlaes & Young Information Systems, Inc.

The Comprehensive Real Estate Asset Management System was designed for commercial banks, life and casualty insurance companies, real estate firms and trustees of large real estate investment portfolios, the vendor said.

The software costs \$48,000. Lease terms are available. Shlaes & Young said from 405 N. Wabash Ave., Chicago, Ill. 60611.

up and down and side to side while maintaining column and row titles; vary width of each column individually; vary the width of each cell from 1 to 63 char.; move from cell to cell while highlighting specific cells; perform standard mathematical operations; enter dollar amounts and align decimals automatically; enter, edit and display both formulas and data; sort and load from a file; and print the screen on any printer on the Series/1, according to the vendor.

Calc/1 is available for \$1,500 from H&B Computer Systems, Suite 204, 30 Hotaling Place, San Francisco, Calif. 94111.

'Mastercalc' Fits Point 4's Iris

LOVELAND, Colo. — A spreadsheet program running under Point 4 Data Corp.'s Iris operating system has been announced by Computer Time Share.

Mastercalc runs on any Data General Corp. Nova-type computer using the Iris operating system with 64K bytes of memory.

The user-friendly Mastercalc features split-screen capabilities, trigonometric functions and formatting of output for both screen displays and hard-copy printouts.

Mastercalc is priced from \$700.

Point 4 Data Corp. is headquartered at 1531 N. Lincoln Ave., Loveland, Colo. 80537.

Burroughs Users Get 'Tabucomp'

DENVER — A package said to provide electronic spreadsheet capabilities to users of large Burroughs Corp. computer systems has been introduced here by DSI, Inc.

System/Tabucomp reportedly offers display and printing in three different formats (floating point, financial and rounded integer); three table entry types; and a variety of statistical functions. It features 78 col by 299 rows, with computation capabilities of normal accounting statistics and linear regression that can be used in forecasting, the vendor said.

System/Tabucomp costs \$8,000, a spokesman for DSI said from the firm at 2480 W. Alameda, Denver, Colo. 80223.

BUYING SOFTWARE? LET InfoWorld BE YOUR GUIDE

☐ VISICALC™ --- WORDSTAR™ --- SPELLGUARD™ --- DBMASTER™ --- dBASE II™ are just a few of the software packages reviewed in INFOWORLD's CRITICS' GUIDE TO MICROCOMPUTER SOFTWARE. Presented in this new publication are 40 reviews compiled from previous issues of INFOWORLD. These evaluations represent a cross section of software for a variety of personal computers.

Each review summarizes the product's features, evaluates performance, judges documentation and then rates the product from excellent to poor. What continues to make our software-evaluation process so popular and useful is our independent Software Review Board. To ensure consistency of evaluation, all reviewers adhere to the same guidelines.

We think you'll agree that INFOWORLD's CRITICS' GUIDE TO MICROCOMPUTER SOFTWARE will not only inform you, but will simplify your buying decisions. To order the CRITICS' GUIDE TO MICROCOMPUTER SOFTWARE, just fill out the following form.

VISICALC is a registered trademark of VisiCorp, Inc.
WORDSTAR is a registered trademark of MicroPro International
SPELLGUARD is a registered trademark of Digital Research™
DBMASTER is a registered trademark of DBMaster Associates
dBASE II is a registered trademark of Ashton-Tate



☐ Yes, send me a copy of A CRITIC'S GUIDE TO MICROCOMPUTER SOFTWARE for only \$4.95 + \$1 postage and handling.

☐ My check is enclosed.

☐ Am Ex ☐ BA/Visa ☐ MC

(MC only—fill four digits above your name)

□□□□□□□□□□□□□□ □□□□

Cardholder's signature _____ Exp. date _____

Name _____ (Please print)

Address _____

City _____ State _____ Zip _____

Return form to:
InfoWorld
375 Cochituate Rd., Box 837
Framingham, MA 01701

Delivery from 4-6 weeks

VMBACKUPSM

USER RESULTS: "My backups dropped from 32 hours per week to 4 hours."

VMBACKUP will:

- save personnel time by offering end user file restore capability
- save time & tapes by dumping only data that has changed yielding up to 90% savings in time and tape
- save disk space with Optional end user archiving system.

VMBACKUP Highlights:

- Keeps VM available continuously
- No modifications to install
- Cataloging of minidisks, files, and tapes
- Incremental backup
- End user restore option
- Support for CMS & non-CMS minidisks
- Packing, encryption & chargeback
- Standard label tapes

VMTAPESM

USER RESULTS: "In only one hour VMTAPE changed my tape situation from total chaos to total control."

VMTAPE will:

- manage tape volumes & tape drives
- save data from being clobbered inadvertently by offering standard label tape support
- save operator time by transferring decisions to VMTAPE
- interface optionally to OS/VS tape system.

VMTAPE Highlights:

- No modifications to install
- Interface to MVS or VS1 tape manager
- Services multiple mounts concurrently
- Supports both interactive and CMS BATCH users
- Comprehensive data security facilities
- Extensive expiration date support

VM

Software Inc., P.O. Box 985 • Vienna, Va. 22180 • (703) 821-6886

- ☐ Send information on VMBACKUP.
☐ Send information on VMTAPE for my VM - only machine.

- ☐ Send information on VMTAPE with OS/VS Interface. My OS/VS tape manager is _____

Name _____
 Title _____
 Company _____
 Address _____
 City, State _____ Zip _____
 CPU _____ Phone _____

Introducing a new, cost-efficient way to test the Spanish computer market.

A mailing list from *Computerworld/Espana* will give you up to 9000 EDP and MIS executives throughout Spain.

Now that Spain's trade policies have become more liberal, the country has become a major market for U.S. exports. The tremendous demand for these exports is reflected in a broad range of product categories, with one of the largest being data processing equipment. The Spanish computer market is expected to grow at a rate of 18% per year. There are currently 4,000 general purpose computers at 3,000 sites in Spain with a total installed value of more than \$2.2 billion. In addition, there are 11,000 office computers and Spanish EDP industry revenues are increasing 20% to 30% a year.

You can talk directly to the decision-making executives in this fast growing industry.

Computerworld/Espana, the only EDP newspaper serving the Spanish data processing market, is making its mailing list of these decision-makers available for rental. Take advantage of this unique opportunity to reach these EDP and MIS professionals and to test your product or service in this burgeoning market.

For further information on the *Computerworld/Espana* mailing list just fill out the coupon below.

Diana La Muraglia, Manager
 International Marketing Services
 CW COMMUNICATIONS/INC.
 375 Cochituate Road, Box 880, Framingham, MA 01701
 (617) 879-0700

Please send me more information on
 () *Computerworld/Espana* mailing list

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____



CW COMMUNICATIONS/INC.
 375 Cochituate Road, Box 880, Framingham, MA 01701
 (617) 879-0700

Publishers of *Computerworld*
 and other leading computer
 publications around the world.

Application Manager Out For Use With HP 3000

TULSA, Okla. — An application management system for use on Hewlett-Packard Co. 3000 series computer using HP's Cobol II and V/Plus subsystems has been announced here by Ergonomics, Inc.

The Application Management System 3000 (AMS3000) uses definitions stored in a small HP Image data base to replace the code for such functions, as screen processing, function key processing, customized user menus,

security constraints, opening and closing of all files and the logic flow with specific application routines, according to the vendor.

Also included in the system is a structured source code and a Copylib to facilitate the coding of the various application subprograms called by the AMS3000.

AMS3000 costs \$8,500. Ergonomics is located at Suite 600, 5215 E. 71 St., Tulsa, Okla. 74126.

Cobol-74 Compiler Version Out For Use in Unix Environment

NEW YORK — Advanced Computer Techniques Corp. (ACT) has announced a version of its Full Ansi Cobol-74 Compiler for use in the Bell Laboratories Unix environment.

The initial Unix version targets the Motorola, Inc. 68000 instruction set, and the compiler has been fully implemented in the Pascal language, according to the vendor. The product features Ansi Standard X3.23-1974, and the nucleus and 10 function modules reportedly conform to the

Level 2 standard.

The modules include table handling, sequential I/O, relative I/O, indexed I/O, sort/merge, segmentation, library, debug and interpretation communications. It also has a multipass design structure and object code generation for commonly used Cobol statements.

The compiler is priced at \$230,000. Further details are available from ACT at 437 Madison Ave., New York, N.Y. 10022.

'MFG/1000' Runs on HP 1000

SAN JOSE, Calif. — Trans Micro Systems, Inc. has announced three packages for users of Hewlett-Packard Co. HP 1000 processors in manufacturing applications.

MFG/1000 is a complete manufacturing management package designed to optimize inventory investment, improve productivity and cut operating expenses. The package uses HP's Image data base and is geared to the nontechnical user, the vendor claimed.

MFG/1000 features five interactive modules: inventory control, bill of

materials, work-in-progress, purchasing and material requirements planning. The package costs \$35,000, the vendor said.

MFG/Plus is a financial package that also uses the Image data base. The package includes accounts receivable, accounts payable, order entry, inventory control, general ledger and payroll. The package costs \$15,000, the vendor said.

Ask/1000 is a query language for data base report generation. It costs \$6,000, the vendor said from 2233 Bailey Ave., San Jose, Calif. 95128

Package Puts SSP, OCL on Menu

TOMS RIVER, N.J. — Sys/34 Associates has announced a menu-driven programmer Productivity Aids package for IBM System/34 processors. The package reportedly takes commonly called system support program (SSP) and operator control language (OCL) and places them on a free-form menu.

In addition, the package contains operational aids such as file handling, documentation, programming and debugging to help improve user

productivity, the vendor said.

The documentation module features a full cross-reference listing of libraries showing the correlation and interrelation of all programs, procedures and data files, the vendor said.

The debugging module features a display method that allows the user to display files by relative record numbers or record keys, the vendor said.

The package costs \$150 including programs, procedures and documentation, with a money-back guarantee. Sys/34 Associates can be reached through P.O. Box 2134, Toms River, N.J. 08753.

'Scred' Update Offers WP, On-Line Tutorial

NEW YORK — Relational Data Systems (RDS) has introduced Release 2.10 of its Scred software for Data General Corp. computers. The updated Scred reportedly offers new word processing features and a complete on-line tutorial.

Scred is a screen-oriented text editor that runs on all DG operating systems, the vendor said.

Scred for DG Rdos, DOS and Icos operating systems costs \$950. The AOS and AOS/VS versions are priced at \$1,200 each.

RDS is located at 205 E. 42nd St., New York, N.Y. 10017.



'I See You've Had a Lot of Experience With Computers.'



**You have the information.
We have the way to move it.**

It's extraordinary how far American business has gone in managing information in the office.

And how frustrating it can be to get that information where it's needed, once it leaves the office.

Your computers, for example, can swap data with each other. But if you need to transmit that data to less sophisticated or incompatible equipment, you can't.

Our Communications Spectrum

It seems clear that something must be done to bring the movement of information outside the office to the same sophisticated level as inside the office.

Improving the movement of that information is precisely what we at ITT Worldcom are doing now with our Spectrum of Communications Services.

To put it simply, our Spectrum is a new range of worldwide information movement services. We've created it specifically to bring together the latest advances in data and record communications.

So, returning to our example, your computers and terminals are now able to talk to any other terminals, anywhere in the world. Even those on other networks.

Now throughout the U.S.

You can even deliver the same information to an unlimited number of terminals, automatically.

And we're continually adding new service features to our Spectrum with an eye to satisfying your future requirements.

The way we look at it, whatever other productivity problems American business has, it's producing more and more information.

And getting that information where it's needed speedily, reliably, efficiently and economically—that's what ITT Worldcom is all about.

I'd like more information.

C-9-82

My area of particular interest is in:

☐ Communications within the U.S.

☐ International Communications

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Marketing Department (A/PR)

ITT World Communications Inc.

67 Broad Street

New York, New York 10004

ITT

ITT World Communications Inc.

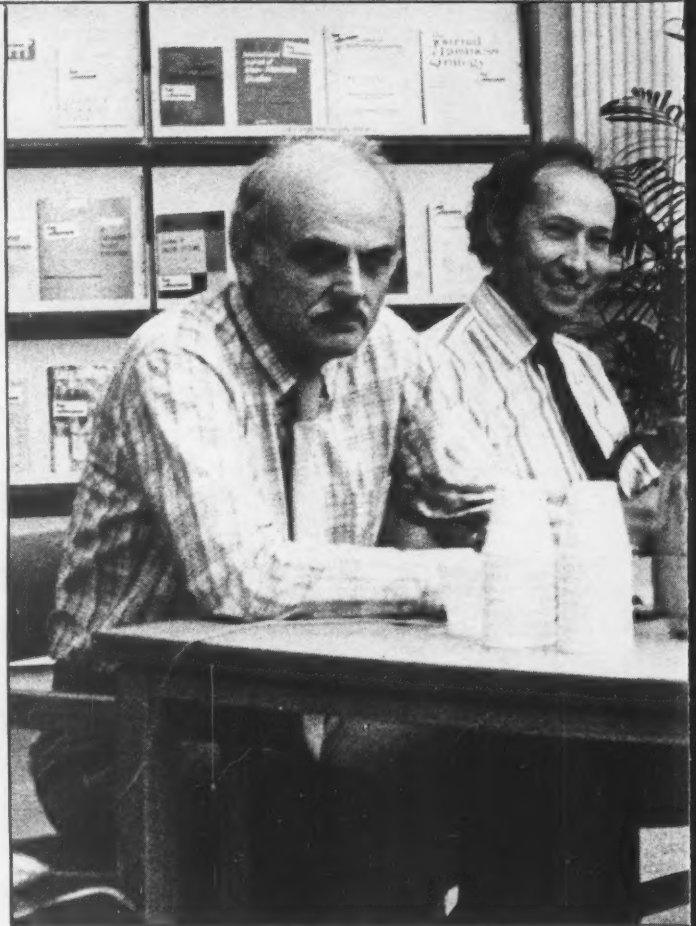
THE DATA BAS

Relational or Codasyl?

That was the central issue of a lively debate among top authorities in the data base field, held recently at the Wang Institute of Graduate Studies, Tyngsboro, Mass.

Dr. Eugene Wong moderated the meeting of the minds: Dr. Edgar F. Codd and C.J. Date represented the relational side, while Charles Bachman and Frank Manola took the Codasyl side. Questions from the audience were also considered. An abridged version of the debate follows.

More information on the differences between the relational and Codasyl data base approaches is provided on In Depth/5.



WONG: Why is it taking so long for relational data base systems to gain market acceptance?

CODD: The question presumes that they have not gained market acceptance. Now, where they exist as products they are doing very well. [IBM's] SQL/Data System is now generally available and is doing exceedingly well. The feedback from SQL installations is very very positive. People are citing productivity increases of anything from five to 20 times what they had in previous systems.

So the delay is more one of getting products out, and this has been due to a great many factors, some of which I will not go into now. (laughter)

DATE: Clearly, some technical invention was required to get to the product stage from the original definition of the model in 1969, 1970. With regard to performance, it's essential to have a compiling approach — the ability to recompile automatically when things change in the overall system. Until that work was done in System R, although perhaps in principle some of us could see how it could be done, it had *not* been done. People were therefore still somewhat skeptical. Now that it has been done, we're beginning to see that things can really be made to work well.

BACHMAN: Not having been involved in the development of relational systems, I don't know why it's taking so long!

MANOLA: I have a question to ask in response to the question. If there was a 20 times productivity increase over exist-



Edgar F. (Ted) Codd

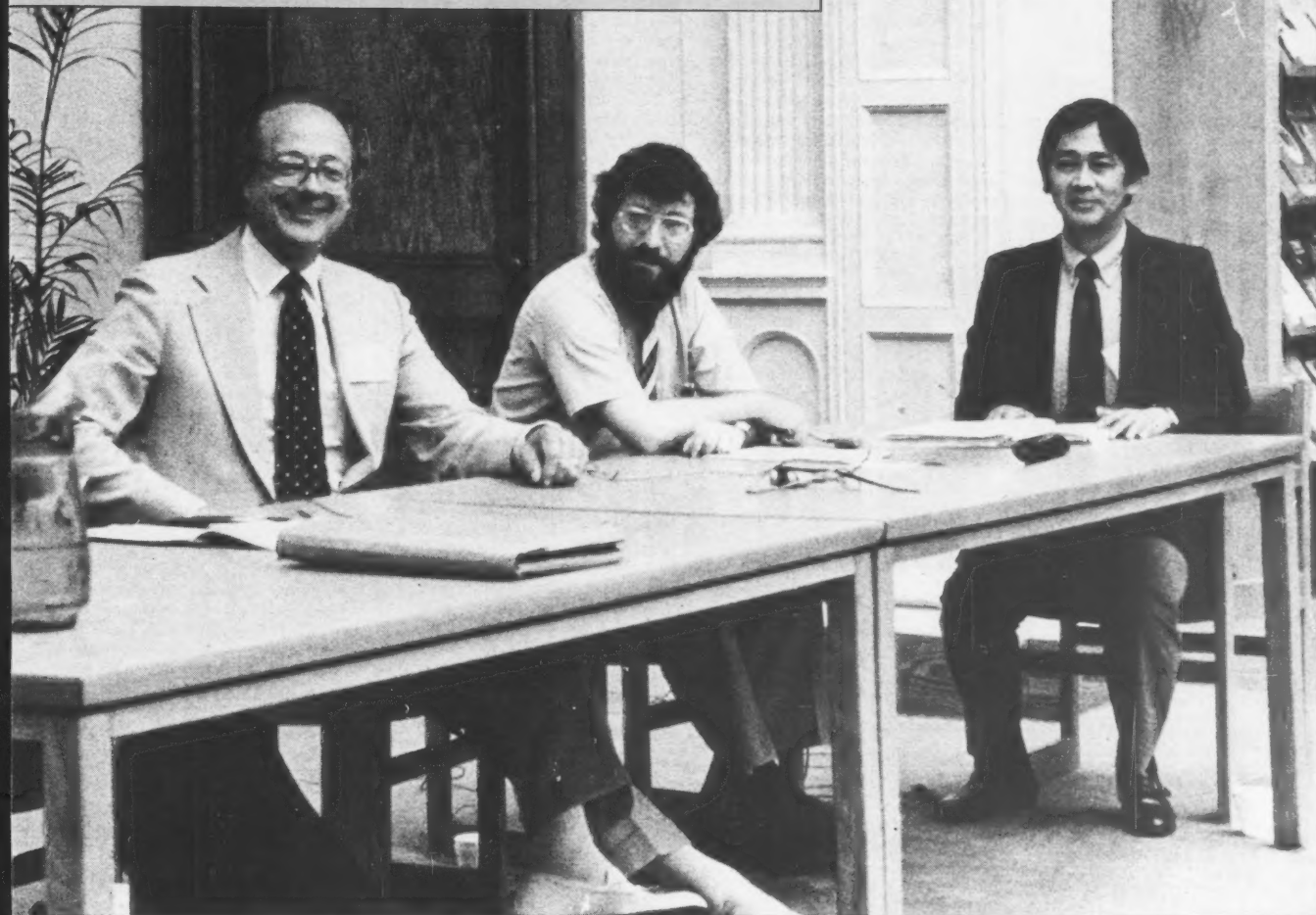
is the originator of the relational model for data bases. His relational algebra, relational calculus and normalization of relations have had a profound impact on the data base management field. The author of *Cellular Automata*, Codd has worked on the logical design of computers (IBM 701 and Stretch), one of the first operating systems with a general multiprogramming capability and a subsystem to analyze and synthesize English for nontechnical users of relational data bases. He holds an M.A. and B.A. in mathematics from Oxford University, England, and an M.Sc. and Ph.D. in computer and communications science from the University of Michigan. A Fellow of IBM and of the British Computer Society, Codd was the 1981 winner of ACM's Alan M. Turing Award for his work on data base theory. He is currently engaged in research at the IBM Research Laboratory, San Jose, Calif.



C.J. (Chris) Date is

with IBM in Santa Teresa, Calif. He has been active in the field of data bases, and especially relational data bases, for more than 10 years. The author of *An Introduction to Database Systems*, Date was responsible for the design of Unified Database Language (UDL), a proposed data base programming language. After working as a programmer and programming instructor with Leo Computers Ltd., London, Date joined IBM in 1967 as an instructor to help develop and teach a comprehensive training program in computer system fundamentals, IBM 360 assembler language and PL/I. He helped establish the IBM European Laboratories Integrated Professional Training Program, a cooperative education plan in which he developed and taught a course on relational data base. Date holds a degree in mathematics from Cambridge University, England.

THE DEBATE!



CW Photo by C. Marengi

Charles Bachman is vice-president of Cullinane Database Systems, Inc. in Westwood, Mass., where he is involved in the conceptualization and design of new information processing products. Bachman invented the network or Codasyl model for data base systems while at General Electric Co. and published his work in 1964. In 1966, he was a founding member of the Codasyl Data Base Task Group. He worked with Honeywell, Inc. from 1970 to 1981 and then assumed his present position at Cullinane. Winner of ACM's Alan M. Turing Award in 1973, Bachman is chairman of the International Standards Organization's committee on Open Systems Interconnection. He received a B.S. in mechanical engineering from Michigan State University and an M.S. in mechanical engineering from the University of Pennsylvania. In 1977, he was named a Distinguished Fellow of the British Computer Society.

Frank Manola is senior computer scientist at Computer Corp. of America's Research and Systems Division, Cambridge, Mass. He is currently managing the development of a high-level query language called CQLF (Codasyl Query Language, Flat) for Codasyl-type data base management systems (DBMS) and a component architecture for DBMS. The project, sponsored by the National Bureau of Standards, is currently engaged in the formal definition of the relational, network and tree data models and the development of data base language user interfaces based on those models. Manola was a member of the Codasyl Data Description Committee for nine years and is now a member of the Ansi X3H2 committee. He holds a B.S. in civil engineering from Duke University and an M.A. in computer science from the University of Pennsylvania.

Eugene (Gene) Wong is professor of electrical engineering and computer sciences at the University of California, Berkeley, where he has taught since 1962. His current research interests include many aspects of data base management systems, with special emphasis on query processing, logical design and schema conversion. He was a cofounder of Relational Technology, Inc. and a codesigner of that firm's Ingres relational DBMS. He has published extensively on DBMS and on systems theory and has been named to various fellowships, including National Science Foundation Post-Doctoral Fellow to Cambridge University, England; a John S. Guggenheim Fellow; and a Harvard University Hayes Fellow. A fellow of IEEE and a member of ACM, Wong holds a B.A. and Ph.D. from Princeton University.

IN DEPTH

ing systems cited, perhaps we should know whether the existing systems were IMS installations . . .

CODD: It's fortunate that I do not have the specific data . . . (laughter)

WONG: My next question, for Charlie Bachman: You've been prominently associated with various standardization efforts, in particular, the attempt to standardize Codasyl systems. Isn't standardization based on

past rather than present or future concepts? And in a fast-changing technology, doesn't that imply that you're casting in concrete things which may already be obsolete?

BACHMAN: It's an interesting question, and I think it's one that should be answered as clearly as possible.

Standardization is a mechanism by which some organization tries to arrive at a consensus about what is a good set of facilities that does some-

thing, whether it's screw-on bolts or standard colors of paint, or standard ways to distinguish the men's room from the women's room. Now, if they were an end in themselves, then they would have certain value. But typically, the standard is a foundation from which you make the next step forward. In the absence of that set of standards, you must end up stuck on this level where you cannot go forward.

Standards, in one sense, freeze one

level of development while making available the next level of development. So standards are a mixed blessing. You lose certain flexibility, but you gain a firm foundation from which you can jump higher.

CODD: I would say that in certain fields, adoption of standards has enabled one to go forward and think of higher level things, like adopting a standard size for a screw in some machinery has enabled you to forget about whether to use a different size screw — say, a nonmetric screw — and consider more interesting problems.

But in software, I don't see standards as providing this platform for future development. I see research as providing the platform — and I mean *continued* research — being dissatisfied with what you've done. And standards are not that. Standards are being satisfied with what you've done.

BACHMAN: I think, though, we must distinguish whether we're trying to do academic research or trying to get on with putting better production control systems into existence, better payroll systems, better airline reservation systems. If one looks at either the network model or the relational model, both are ancient by the point of view of computer systems.

Now, Ted's work was published in 1969, I believe, in ACM; my work was published in '64 at the Fall Joint Computer Conference. I think they're five years apart. And neither one of those has really hampered anybody from doing some useful work. Now, one of them may have helped people do a lot of useful work.

CODD: May I say, speak for yourself?

BACHMAN: I wasn't speaking for you, Ted! (laughter)

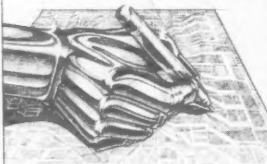
MANOLA: I think that the wrong villains are being placed on the opposite ends of this spectrum. I think that there's a lot of confusion when data base standards are discussed. And people don't define their terms.

A key issue, for example, is, are you talking about *one* data base standard or *many* data base standards? When people talk about standardization of Codasyl, sometimes what they're really objecting to is the establishment of *one* data base standard, not the establishment of a standard for Codasyl systems that says, "All Codasyl systems shall look like this."

CODD: The attitude of the Codasyl group when I first encountered it was, "We're going to pull off another Cobol! And be the dominant language, as far as data base is concerned." So there was good reason for fearing that standard activity. Now I must say, the same kind of dominance by dictum was the aim of some of the PL/I developers. So

THE TIME MACHINE.

Imagine a time when all your data processing solutions are limited only by your imagination. Think of a time when programs are created by the computer, not you. Dream of talking to the computer in your language instead of codes and symbols. The time is now. The Time Machine is the SEQUEL™ system.



THE SEQUEL™ SYSTEM: A DESIGN AHEAD OF ITS TIME.

A design that is a synergism of high-powered hardware and sophisticated software. The SEQUEL system. An integrated computer system designed for one purpose. To create time. To solve complex business problems faster and easier than ever before.

The SEQUEL computer system is designed on the basis of Microdata's proven REALITY® data base management operating system. Then we enhanced its architecture with a highly efficient 32 bit processing system. We gave the

SEQUEL system power with as much as 2 million bytes of main memory. And backed it up with 1 billion bytes of disc and the ability to respond to 127 user terminals.

THE SEQUEL SYSTEM: APPLICATIONS IN MINUTES NOT MONTHS.

The SEQUEL system brings you a future of programming ease. A time in which the computer creates its own programs. With ALL™ Microdata's new application language liberator, the SEQUEL system literally thinks for itself. Now SEQUEL does in hours what took days or months.

THE SEQUEL SYSTEM: INFORMATION RETRIEVAL AS EASY AS REACHING INTO A FILE.

With Microdata's data base management system, business

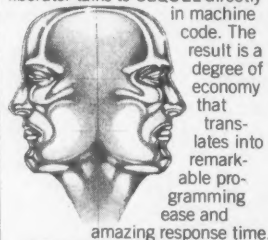
information is available in logical file structures you dictate. And you can ask for that information using the ENGLISH® information retrieval language instead of complex codes and symbols.

THE SEQUEL SYSTEM: IT WORKS SO FAST BECAUSE IT TALKS TO ITSELF IN COMPUTER LANGUAGE.

The reason: Microdata's ALL application language liberator talks to SEQUEL directly in machine code. The result is a degree of economy that translates into remarkable programming ease and amazing response time.

The SEQUEL system. Backed by Microdata's worldwide network of customer service centers.

For complete information and a hands-on demonstration write Microdata Corporation, P.O. Box 19501, Irvine, CA 92713. Or call toll-free 1-800-821-7700, ext. 518 (except Alaska and Hawaii) for the location of your nearest Microdata representative.



Microdata
We Build Understanding
Into Computers.

don't feel I'm just criticizing people outside of IBM.

MANOLA: And PL/I was created after Cobol, so the existence of Cobol didn't stifle that development!

CODD: There was a considerable number of people who thought that PL/I was going to be the one universal programming language.

MANOLA: Can I finish up? As far as the ability of the standard to enable further progress to be made, if you standardize something that's flat and can be easily built upon, it's great. When you standardize something that's uneven, you're going to construct some funny-looking thing. So there is no question about the fact that the content of the standard is important.

But one of the things that standards are for is to allow the users to have something to say in how the thing develops, as opposed to allowing the vendors and people who are able to twiddle with the language definition to decide by themselves how the thing's going to evolve.

BACHMAN: A point to make, to fol-

Codasyl vs. Relational: In a Nutshell

The Conference on Data Systems Languages (Codasyl) data base approach is based on a two-level set or tree structure, with the programmer navigating through the data base. Also called the network model, the Codasyl model has the ability to declare and manipulate owner-member set relationships, which are structured to represent one-to-many relationships among the application world entities that they represent.

The Codasyl committee adopted a data base standard called Network Model 1, which has been incorporated into several commercial offerings. These include IDMS (Cullinane Database Systems, Inc.), IDS and IDS II (Honeywell, Inc.), Seed (International Data Base Systems, Inc.) and DBMS-10 and -20 (Digital Equipment Corp.), according to Frank Manola.

The prototype for the Codasyl model was the Integrated Data Store (IDS) product, which Bach-

man is also responsible for Cullinane's data base product IDMS. Network Model 2, recently completed, has not yet been implemented commercially.

The relational model is characterized by flat files or tables called relations, organized into a homogeneous set of records called tuples (rows) and domains (columns).

Unlike the Codasyl model, the relational model is designed to support automatic navigation to the target data. There are no user-visible navigation links between tables, which is said to ease data access by nonprogrammers. Each relational record within a relational file must be unique and must not represent more than one application world entity.

The prototype for the relational model was System R, developed by Codd at IBM's San Jose Research Laboratory. In January 1981, IBM announced its first fully supported relational product,

SQL/Data System (SQL, pronounced "sequel," stands for Structured Query Language). In 1979, Codd published his work on the relational model RM/T, which extends the semantics of the basic relational model.

Descriptions of 70 commercially available relational or relational-like systems were submitted to the Ansi Relational Task Group, which was set up to explore the feasibility of a relational data base standard. The group's final report is now available. Codd reports that all U.S. hardware vendors have relational systems under development.

Some representative relational products, besides SQL/DS, are IDM 500 (Britton-Lee, Inc.), MRDS/Linus (Honeywell, Inc.), Nomad (National CSS), Oracle (Relational Software, Inc.), Ingres (Relational Technology, Inc.) and Encompass (Tandem Computers, Inc.), according to Codd.

In computers, think IBM first... From that point on- think **GMI**



When you decide which IBM system best fits your needs, then decide on CMI. Few companies can match the level of professionalism CMI is noted for.

Our experts in Marketing, Financial Services, Operations and Sales have proven over the years that having CMI on your side is a decided edge.

S/E SUPPORT

S/E support and/or test time can be provided with a system supplied by CMI to ensure a smooth conversion.

IBM ACCEPTABILITY

All CMI supplied equipment is certified eligible for an IBM maintenance agreement.

BRANCH OFFICE SUPPORT

CMI's plan is to keep you as an IBM customer running on IBM Systems.

DELIVERY & PRICE

CMI promises...Fast delivery
Lower purchase price
Lower lease rates
More flexibility

In addition, we can structure a Purchase/Leaseback on your present system and save you money while offering upgrades, lease extensions and purchase options.

GMI CORPORATION Since 1969
755 W. Big Beaver, 19th Floor, Troy, Michigan 48064
(313) 362-1000

IN DEPTH

low in that direction: The need for standards will become much more obvious when we are trying to operate across multiple computer types — if someone tells me, "I can't live with just Manufacture A or Manufacture B of these computers." The need for a homogeneous protocol for remote data access and update will in fact force the development of homogeneous data management systems.

CODD: The French have recognized

this for some time. With regard to their population statistical data bases, they have data bases for the citizens who lived in all the various regions of France, and they had, as of the early '70s, different data base management systems in the different regions. They then discovered that they wanted to do transactions on the totality of data, and they had no standard at that time. They looked into the relational model, adopted it and implemented a system that gives

you a relational view of the totality of the data.

BACHMAN: In the last few years I have been very active in the International Standards Organization's work on Open Systems Interconnection. One of the critical aspects of compatibility is not compatibility at compile times, but rather compatibility of the microsecond level. Either a computer talks the same protocol that your computer does, or it

doesn't. If it doesn't, you're all done.

One of the things you want to be able to do is to get from an arbitrary computer A to an arbitrary data base Z with a protocol-defined request. There had better be some standards on how you express that requirement of the destination data base or you're just out of business.

We've had a lot of struggling about data base standards and a lot of opposition to them. But if you want to distribute data base access, you'd better face up to the need for standards, or the system won't understand what you're saying to it.

FLOOR: According to Dr. Codd, the added benefit of the relational model is that it's distributable. Now Mr. Bachman has just mentioned distributed transaction processing. What does the network model have to that effect?

BACHMAN: When you're distributing parts of the data base, you're also distributing the declarations that go along with that. And once you set up the mechanisms to understand semantics of the language, it doesn't really matter what data model you pick as long as all the processing elements understand. You can do it at the network level, in terms of a network data base; you can do it with the relational data base.

CODD: I would like to add, there is much more freedom in decomposing a relational data base for distribution.

By contrast, with a Codasyl network data base, the structural links reduce the freedom of slicing tables into portions to be distributed to different nodes of a computer network.

I think Charlie's answer assumed that when you were going to parcel out a Codasyl data base from one place to perhaps several other places, you took certain of the declarations and moved them to, say, Node A, certain other declarations to Node B, other declarations to Node C...

BACHMAN: No.

CODD: No?

BACHMAN: No.

CODD: Well, how is this distribution occurring?

BACHMAN: Let me give you one possible model. Today all of the Codasyl, or network, systems are inherently paging systems, virtual memory systems, which unfortunately don't cooperate very well with the program virtual memories. But at the present time, to access a record, the data base system says, "Oh, you want this page, and it's on that disk. I'll bring the page from the disk into my computer."

At this first level of distribution, I've got a virtual memory that is distributed, not on my 100 disks at one

UPS at 1/3 the cost!

The answer is a unique Dual Feeder Uninterruptible Power System (UPS) developed by K/W Control Systems.

It's the first and only dynamic UPS system to offer total power protection without the use of batteries!

The result: lower equipment costs, lower installation costs, and much, much lower maintenance and operating costs than conventional static, battery-powered UPS systems!

Just what you'd expect from K/W Control Systems, Inc., the leading supplier of power protection systems for IBM, AMDAHL, CDC, UNIVAC, and other leading mainframe manufacturers.

For complete details and further information on the new K/W Control Systems Dynamic UPS System, contact: Mr. Murray Lazar, Director of Marketing. (914) 355-6741.

Free Brochure
Available
on Request



CONTROL SYSTEMS, INC.

South Plank Road, Middletown, New York 10940
Phone (914) 355-6741 TELEX No. 13-7428

IN DEPTH

computer, but on these thousand disk drives or 10,000 disk drives at different computers. Then when I ask for a page that's not on my machine, the system finds out what machine it's on. And that page will be brought to me, just as if it had come off my local disk. In this sense, any system accessing data has exactly the same set of declarations, and distributed access is controlled at the physical level. Each system knows where every page is stored.

FLOOR: Are you saying, then, that the network model, where you begin to distribute it, looks like the physical model, whereas, as Dr. Codd has stated, the distribution of the model is at the logical level?

BACHMAN: It's possible to distribute at three different levels. The example I've given you is distributing at the physical storage level. Say a set of banking records for the San Francisco office are in the San Francisco

computer, and the banking records for the Los Angeles office are in the Los Angeles computer. You can also distribute at the logical level. In fact, you can do distribution at several different levels, each one of which is optimal under certain circumstances.

We're getting into the packaging details, and we can't get very far in terms of where each one works best. But there are several different implementations, all of which are practical and doable.

CODD: However, the Codasyl model has a problem if you do the kind of distribution where you say the San Francisco records are going to be over there and, say, the New York records are going to be over here. And you want a Codasyl set that spans the lot.

BACHMAN: Why is that a problem, Ted?

CODD: Because the thing is, while you might want to have an overall logical schema that covers the totality of data for the whole network, you probably also want local schemas that are known to be local. OK? It seems to me that one should start

with the problem of planning how to distribute a given *data base description*. With the Codasyl model, you have the serious problem of carving up the owner-member links. No such problem occurs with the relational model.

MANOLA: It seems to me that there are a number of unstated assumptions affecting the various sides of this discussion. I wouldn't contemplate a very effective distributed Codasyl system unless it had, first, high-level operations; second, contemplated implementation techniques for the sets other than lists. I think under those assumptions it becomes no more or less difficult to distribute a Codasyl system than a relational one.

CODD: OK, so you're talking about Network Model 2...

MANOLA: Yes.

CODD: ... I agree, when you get to Network Model 2, you've certainly got more distributability. You can manage the thing better than in the Model 1.

However, we've yet to see a Net-

Point-Counterpoint On Standards

WONG: Isn't standardization based on past rather than present or future concepts? And in a fast-changing technology, doesn't that imply that you're casting in concrete things which may already be obsolete?

BACHMAN: Standardization is a mechanism by which some organization tries to arrive at a consensus about what is a good set of facilities. If standards were an end in themselves, then they would have certain value. But typically the standard is a foundation from which you make the next step forward. In the absence of that set of standards, you must end up stuck on this level where you cannot go forward.

Standards, in one sense, freeze one level of development while making available the next level of development. So standards are a mixed blessing. You lose certain flexibility, but you gain a firm foundation from which you can jump higher.

CODD: I would say that in certain fields, adoption of standards has enabled one to go forward and think of higher level things... But in software, I don't see standards as providing this platform for future development. I see *research* as providing the platform — and I mean *continued* research. Being dissatisfied with what you've done. And standards are not that. Standards are being satisfied with what you've done.

BACHMAN: I think, though, we must distinguish whether we're trying to do academic research or trying to get on with putting better production control systems into existence, better payroll systems, better airline reservation systems. If one looks at either the network model or the relational model, both are ancient by the point of view of computer systems... And neither one of those has really hampered anybody from doing some useful work. Now, *one* of them may have *helped* people do a lot of useful work.

MANOLA: I think that the wrong villains are being placed on the opposite ends of this spectrum. A key issue, for example, is, are you talking about *one* data base standard? Or *many* data base standards? When people talk about standardization of Codasyl, sometimes what they're really objecting to is the establishment of *one* data base standard, not the establishment of a standard for Codasyl systems which says, "All Codasyl systems shall look like this."

CODD: The attitude of the Codasyl group when I first encountered it was, "We're going to pull off another Cobol! And be the dominant language, as far as data base is concerned." So there was good reason for fearing that standard activity. Now I must say, the same kind of dominance by dictum was the aim of some of the PL/I developers. So don't feel I'm just criticizing people outside of IBM.

MANOLA: And PL/I was created after Cobol, so the existence of Cobol didn't stifle that development...

But one of the things that standards are for is to allow the users to have something to say in how the thing develops, as opposed to allowing the vendors and people who are able to twiddle with the language definition to decide by themselves how the thing's going to evolve.

BACHMAN: The need for standards will become much more obvious when we are trying to operate across multiple computer types. The need for a homogeneous protocol for remote data access and update will in fact force the development of homogeneous data management systems.

ATTENTION All Mid Atlantic Computer Dealers, Systems Houses And OEMs

A **Free one day seminar**, sponsored by the Zamoiski Co. and Zenith Data Systems will be held to introduce the new family of Zenith computers. The seminar will include hands-on instruction on the revolutionary Z-100 computer as well as the all-new ZT1-A terminal.

Locations are:

Sept. 21st	1101 DeSoto Rd., Baltimore, MD
Sept. 23rd	Castle in The Sand, Ocean City, MD
Sept. 28th	Hyatt, Richmond, VA

For further information
or reservations call:

Toll Free	(800) 638-5032
Baltimore	(301) 644-2900
Washington, D.C.	(301) 322-2000



**data
systems**

Introducing The Most Important **BREAKTHROUGH** Ever In Computer Software

For the first time, decision-makers—in particular, top management—can now access and analyze information about a company's operations in time to take corrective action before it's too late. This has always been the promise of computers that until now has never been fulfilled.

Cullinane delivers on this promise. With a unique 3-level integration of database, applications, and decision-support systems working together in an elegant way. The Cullinane way.

BREAKTHROUGH #1 - Database Integration

Cullinane's Integrated Database Management System (IDMS) is the most comprehensive set of database tools ever developed using the most advanced technology. More importantly, these tools are designed to work together under the control of an "active" Data Dictionary. These tools include Application Development Systems, OnLine Query, Report Writer, Distributed Database, Text-Editing and other facilities. All supported by IDMS the most advanced database management system, a sophisticated combination of network and relational architecture. The superior backup and recovery facilities of IDMS provide unparalleled reliability and integrity for online operations. Applications are designed and developed much faster with the ADS/OnLine System. The newest, most powerful and easiest-to-use application development system available. IDMS's unique distributed database capability makes it possible to distribute database access, applications, and decision-support throughout the organization.

Mostly, though, it's the way that Cullinane's database software works together that has gained it such wide acceptance. The reliability of IDMS is legendary, and its unsurpassed ease of use makes it the ideal foundation for improved data control, data access, and the development and execution of future applications.

BREAKTHROUGH #2 - Database Applications

Cullinane also recognizes that integration across applications is critical. Every application—like every organizational function—impacts others in the system.

The result is, that Cullinane now offers complete modular applications software that can be put together in virtually any combination to meet a wide range of processing requirements: manufacturing, material control, finance and accounting, customer service, production control, distribution, human resources management, purchasing, cost analysis, and many more. Each module offers superior functionality, and all are integrated via a common IDMS database—making them much easier than traditionally developed applications to install, tailor, and maintain.

BREAKTHROUGH #3 - Decision-Support Systems

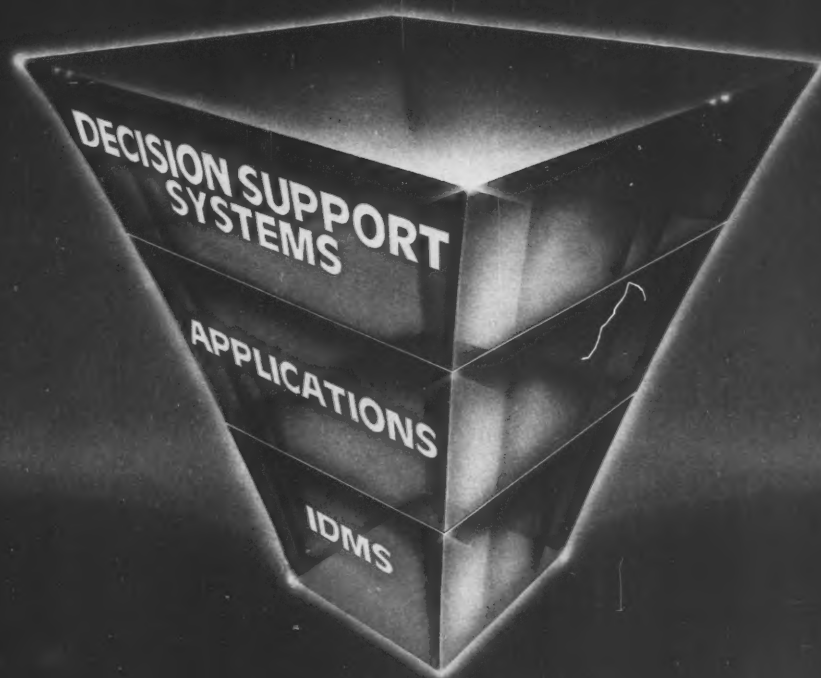
For the first time, decision-makers—in particular, top management—can now access and analyze current information about a company's operations in time to take corrective action, if appropriate. This has always been the promise of computers that until now has never been fulfilled.

This is accomplished via Cullinane's Trendspotter™ System—a powerful color-graphic information system that brings database access right into the boardroom. Executives can produce any graph or chart they need from the database by selectively touching a touch-sensitive screen.

Our OnLine English package lets managers and professionals with no computer background use simple English-language statements to request information from the database. Our financial modeling capability facilitates financial and statistical forecasting and offers "what-if" and impact analysis. In addition, EDP-AUDITOR-1983, a special language designed for auditors is also available for use in auditing the database to insure its integrity and its compliance with accounting control standards.

Trendspotter™ is a trademark of Computer Pictures Corporation

CULLINANE: QUIETLY REVOLUTIONIZING SOFTWARE



The True Integration of Database, Applications, and Decision-Support Systems.

Three-Level Integration - The most important BREAKTHROUGH in software ever.

Cullinane delivers results to the decision-maker with full software integration. It provides three levels of integrated software, but it also integrates each level with the others. So all Cullinane applications are fully integrated with the company's range of database software, and all Cullinane decision-support systems are fully integrated with both Cullinane applications and IDMS.

What this means is that for the first time top management can instantaneously access any database in the company. More importantly, Cullinane gives management the tools to quickly find the data it needs, and then use it directly in making critical business decisions.

Find out how Cullinane's unique three-level software integration can help you deliver on the promise of computers to your company's top management. Attend a free Cullinane Seminar in your area soon. The next breakthrough could be in your business.

For a listing of our software seminars, dates and cities, complete and return this coupon to Rosa'ie Cope, Cullinane Database Systems, Inc., 400 Blue Hill Drive, Westwood, MA 02090.

CW/9-13

Name _____
Title _____
Company _____
Address _____ Telephone # _____
City _____ State _____ Zip _____
My operating environment is _____
Cullinane software works with all IBM 360, 370, 30XX and 43XX computers — or plug compatible equivalent.

IN DEPTH

work Model 2 implementation.

BACHMAN: I think you're stretching too hard, Ted. I think that you're using Network Model 2 to mean a little more than it is and to demean Network Model 1.

CODD: No, I don't think I'm putting down Network Model 1. Network Model 1 was certainly a contribution.

BACHMAN: I'm glad it was.

CODD: ... The point is, what Frank talked about this morning is certainly an enrichment by a considerable factor of Network Model 1. High-level operators that, so far as I know, have not yet been implemented in any system. Now, what I would contend is that the enrichment is going to cause a lot of implementation problems over and above your relational model. For example, optimization — when you're considering how to decode a transaction that en-

tails getting some data from Node A, some data from Node B and so forth, and putting them together.

The kind of optimization needed is going to be far more complicated in Network Model 2 than in the relational system. And we have, I think, in a few places, some experience in that kind of optimization.

FLOOR: What exactly are the variables you're trying to optimize — performance?

CODD: Well, a lot of the goals are in economizing on communication costs. You'd like to, for example, not send data from a node — let's say, San Francisco — to New York to form a join and then send the join back to San Francisco, if instead you could form what's called a semijoin in New York and ship that to San Francisco. In other words, you'd like to decompose your query into fragments that can be executed in the remote places and thereby minimize the amount of communication data that's communicated across the lines. That is the significant objective.

MANOLA: I look forward to finding out what some of these additional complexities are, because while I'm prepared to be convinced to the contrary, I suspect that the additional complexities of distributing a Network Model 2 system will not be that much greater than a relational system. If only because I imagine a fairly straightforward relational representation of the set constructs such that all of the existing optimization methods that have been derived under relational concepts would continue to work.

BACHMAN: I think that in the distributed data base problem, we have to maintain both the update capability as well as the retrieval capability. And it's not clear from anything we've said so far that we've made the case for either side.

WONG: My next question relates to the extended relational model RM/T, and I would like to direct it to Chris Date. It seems to me that by making the relational model, whose primary advantage is overall simplicity, more complex to expand its semantics, you are making something that's streamlined baroque. Why not just admit it, that the relational model is not good in dealing with semantics, is not good in thinking about data as opposed to manipulating data, and say, "Let's choose an entity-relationship model as an alternative for these purposes?"

DATE: I hope you're not trying to be provocative, Gene!

That's the sort of question that requires quite a lengthy answer, I think. In our RM/T work, we were adding only things that *essentially* needed to be added to the model to support new kinds of constructs like associations, designations and so on.

Now to some extent, of course, it's true. You're complicating the model by adding these additional semantics. But the thing I must emphasize is that this applies mainly at the data base design level. The external users of it, the application programmer or end user sitting at a terminal, still would usually see the same kind of structures that they would see under the normal basic relational model today. Most of the complexities are in the design level and in the mapping

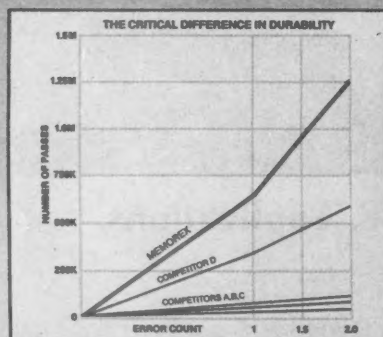
If we don't tell you there's a difference in computer tapes, time will.

The popular assumption for years has been that little, if any, difference exists between computer tapes. That inherent permanent errors, increasing soft errors, edge damage, warped flanges, misloading and other common problems are just conditions everyone must accept.

Memorex® customers know better. They've taken advantage of the technical and functional differences in all Memorex tapes to obtain superior data readability, lower error counts and reduced operating costs.

Only Memorex conducts hypercritical testing of each tape reel, track by track, at signal remaining levels up to 100% higher than system requirements. This locates even the smallest errors so your system doesn't have to.

And you can count on Memorex



tapes to last longer because the average yield strength of our tapes is nearly double the industry standard. This means less library upgrading and more media savings.

In addition, all Memorex tapes are

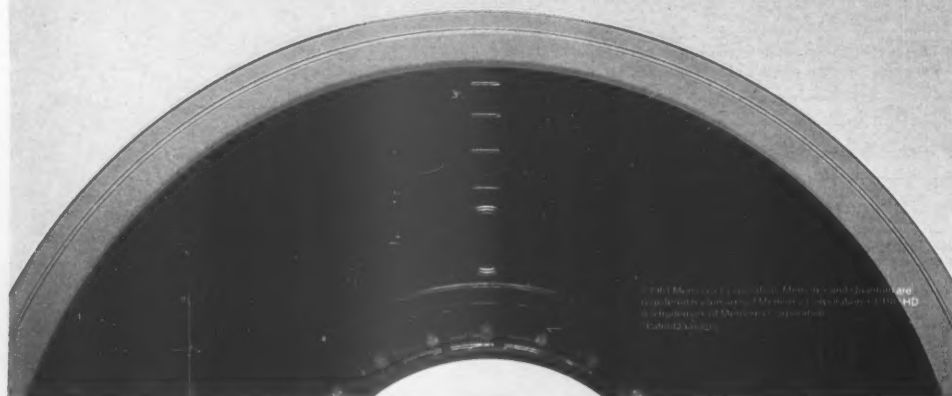
wound on SuperReel II® With its superior I-beam construction, SuperReel II provides virtually 100% autoloading while eliminating the problems caused by warping or cracking, tape cinching or slipping, and edge damage.

Whether your system is 1600 bpi or 6250 bpi, our special premium Cubic HD™ and Quantum® provide the assurance of quality and data safety that means top performance over the years.

There is no better time to put premium tape reliability to work for you. Call Memorex or your local Memorex distributor today.

And now, for a limited time, a free booklet "How to Evaluate Computer Tape" is yours for the asking. Write Marketing Dept., Computer Tape Div., 1125 Memorex Dr., MS-0084, Santa Clara, CA 95052.

MEMOREX
A Burroughs Company



IN DEPTH

between the design level (the RM/T level) and the external level.

Furthermore, a lot of the complexity, I think, is in the description of what's going on. It all sounds complicated because we have to use all this new terminology all the time. But I sincerely believe that if you go away and think quietly about it and try to understand it, it is not difficult. It just sounds difficult because there's so much it's overwhelming.

WONG: Some of the semantic constructs that you introduce have been introduced in models before. Why proliferate terminology?

DATE: That's a bad thing to do, I agree. And it's true, quite possibly things like associations, designations and so on have been introduced in other models before.

I don't think it's so much a question of proliferation, however. It's just trying to choose a set of terminology that does not conflict with the basic terminology in the basic model we're trying to build on. So that rules out, for example, words like "attribute," because they already have other meanings, and yes, what I call attributes someone else may call proper-

WONG: It seems to me that by making the relational model, whose primary advantage is overall simplicity, more complex to expand its semantics, you are making something that's streamlined baroque. Why not just admit it, that the relational model is not good in dealing with semantics, is not good in thinking about data as opposed to manipulating data, and say, "Let's choose an entity-relationship model as an alternative for these purposes"?

ties. That's somewhat unavoidable. But I should tell you briefly, there have been many influences on this RM/T work, as Ted acknowledges in his 1979 RM/T paper, and these different influences do not all use a consistent set of terminology.

FLOOR: In your initial answer to the question, you seem to distinguish between the data base designer, the application programmer and the end user. Would you agree to that distinction?

DATE: The distinction I made was between the data base designer on the one hand and the user — be it the application programmer or the end user at the terminal — on the other. These last two kinds of users don't become involved in the com-

plexities of RM/T that we were talking about.

FLOOR: That's where I would naturally disagree.

Surely, what we're all aiming at is that the end user become all three. Maybe not right now, but the ultimate intention is that the end user should be capable of doing all three, acting all three roles.

DATE: I would agree that in certain kinds of installations, it is desirable for the same person to perform all three functions, and certainly I would like to rule out any arbitrary differences between those three roles. But I think that there's no question that in many installations, it's always going to be the case where you have to have an expert who does the data base design, and many many more users who are only interested in the data base for what they can get out of it.

CODD: And where there is one person performing all three roles, generally speaking the data base will be of simpler construction. In other words, you get this specialization of roles where you've got a very rich and probably very large data base to deal with.

FLOOR: I imagine that would be the exception rather than the rule. There are a lot of data bases out there that haven't come into being because we haven't had the facilities for putting



them into place.

DATE: I would agree with you, there are types of applications that we have not been able to realize in the past.

But I would also point out that something like RM/T is clearly sub-settable. If, as Ted suggested a moment ago, those data bases are rather simpler in structure, quite a lot of that stuff simply may not apply, and we wouldn't have to worry about it.

WONG: A brief comment from Charlie Bachman?

BACHMAN: It seems to me, one can interpret the RM/T extension to the relational model in two ways: One is that it is trying to extend the relational model; the other is that it is trying to describe the network model using relational terms. (Codd shakes his head in disagreement.)

They were trying to handle situations that were not adequately handled in the initial relational product definition — situations which many think are very important in terms of doing real data bases. So I am delighted to see the progress they're making. (laughter)

DATE: (throwing up his hands) Can

Computer ills ??? We Have The Prescription

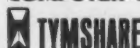


R If you had a serious health problem, most probably you would never consider the maternity ward of a hospital as the place to cure your illness. The computer industry is similar to this. Many original manufacturers cannot properly support and respond to your repair needs due to a manufacturers concentration on producing NEW products. Tymshare's Computer Support Services' extensive depot repair capabilities are

dedicated solely to repair of existing products. Our scope of products repaired and serviced, Quality Control, delivery and pricing, have made us a leader in this industry. We have the prescriptions to make your computer and peripheral equipment well again.

For more information on how our repair and refurbishment programs will best fit your needs, call...

COMPUTER SYSTEMS and SUPPORT DIVISION



31355 W. Agoura Rd. Westlake Village, Ca. 91361
Inside California (213) 889-6031 Outside California (800) 423-5321

* DEC and DIGITAL are registered trademarks of Digital Equipment Corporation

TP DATA STREAM COMPRESSION

CTOP®-CICS Transmission Optimizer

- Instantly improves CRT and printer response
 - Extends capacity of entire network
- Reduces line busy and front-end loads
 - Gives new life to slower circuits
- DQ3, VSE, VSI, MVS, BTAM, TCAM, VTAM
 - No modifications to anything

Site license under \$3,000

H & W Computer Systems, Inc.
P.O. Box 4173
Boise, Idaho 83704 • (208) 377-0336

IN DEPTH



DATE: I think there are two kinds of complexity. One is inherent: You are inherently trying to do a more complicated job. And the other is unnecessary. My personal outlook on the whole data base field is that everything is so complicated anyway that anything we can do to simplify it, we ought to do.

took the relational model and said, "We will divide relations up into two kinds, and they are disjoint: One kind is the entity-relation and the other kind is the relationship-relation." I think actually he made a mistake in making those classes disjoint. Because we definitely want sometimes to think of a relationship-relation as an entity.

FLOOR: I agree with that.

CODD: OK. Now, that simple change really retains the underlying model. In other words, Chen didn't invent new operators or, as far as I know, new integrity rules. He did invent a number of new diagrams, but those are, you might say, design aids. They're not things you necessarily embody when you come to interact with your data base as an end user. I don't see anything, in other words,

strange about being advised to use the entity-relationship model as a design tool and having a relational data base as the end result.

FLOOR: What strikes me as strange is why we should have to go down one level. Why can't we stay at a level and say that is the level where we will think, work, act and do everything?

We just have this silly concept called the relation, which seems to be the root of all evil. It seems to divide the two communities, and I think that's unfortunate.

CODD: I think historically the division between the two camps was very much more marked than it is today. And largely because, in the relational camp, we wanted to have as few primitives as possible — structural primitives and operators. In the Codd approach — it wasn't a model when originally defined — language specifications were introduced, and there was no attempt to make the language minimal. For example, there are 15 different kinds of FIND!

Now if you look at the Codd specs today, you will not find 15 different kinds of FIND, and in fact, they've thrown out repeating groups. I think they would never have thrown out repeating groups had it not

been for the relational work!

BACHMAN: With regard to repeating groups: One must understand that the Codd specifications are the result of a committee. And committees don't always build the most beautiful things. Sometimes they build very useful things, though. And I am going to be very interested to see what the relational specifications look like after a Codd committee or Ansi committee of 10 or 14 people has worked over the specifications.

I would like to refer back to the prototype for the Codd system, which was General Electric's Integrated Data Store (IDS) product. It had no repeating groups. Repeating groups seemed like an inappropriate thing. You see, the repeating group is just another set. It's a different implementation-type thing. And when the Cobol people got hold of it, they said, "We've had those things in the past, and we want to still have them."

CODD: OK, it did not have repeating groups, that's correct. But it did have owner-member sets.

BACHMAN: Oh, it still does. But the basic network model still has owner-member sets.

CODD: But what I'm saying is, why not go the step further and dispense with them, too? (laughter)

BACHMAN: I think the difference we're looking at is whether we're going to have two ways to do the same thing or one. The repeating group is a feature of hierarchical systems such

IBM DOS & OS USERS: MAXIMUM SECURITY FOR CICS.

If you're shopping for a CICS security package because you're concerned with preventing unauthorized access to your CICS files, take a look at Boole & Babbage's SECURE/CICS. It's the most advanced and reliable CICS security software package on the market today, complete with the latest features and capabilities of CICS/VS.

CICS resources can easily be misused, accidentally or intentionally, resulting in disclosure or loss of sensitive information. SECURE/CICS controls access by individual operator and terminal, and also restricts the use of sensitive system and application transactions, programs, and files according to their degree of sensitivity.

SECURE/CICS provides the control and flexibility you need to tailor security to the needs of your installation. And SECURE/CICS is the CICS security product that enables you to maintain and update your CICS security online in both a DOS and OS environment.

See for yourself how much better we are. Call the toll-free number and free yourself from CICS security worries.

For a no obligation evaluation call (800) 22-Boole or write Boole & Babbage at 510 Oakmead Parkway, Sunnyvale, Ca 94086.

SECURE/CICS

Another Harder Working Software Product From

Boole & Babbage

HAD IT WITH COAX?

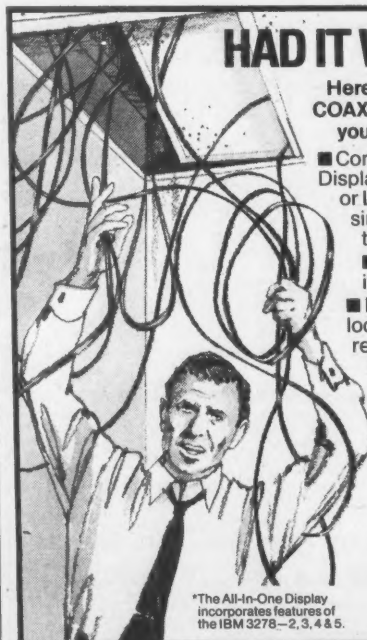
Here's how the new Lee Data COAX ELIMINATOR™ can solve your 3270 cable problems:

- Connects up to 8 All-In-One Displays* to a Lee Data Remote or Local Controller via a single coax cable or a twisted wire circuit.
- Reduces coax cable and installation cost up to 85%.
- Provides access to locations beyond 5000 feet, replacing remote controllers in some instances.
- Achieves local channel response times for devices at remote locations.

Call Our System Specialists
800-328-3998

LEE DATA CORPORATION

10206 Crosstown Circle
Minneapolis, MN 55344
(612) 932-0300



*The All-In-One Display incorporates features of the IBM 3278-2, 3, 4 & 5.

as IMS which support a limited application of the owner-member group. The member can have one and only one owner. The essence of the network model broke through that physical constraint that came from magnetic tape systems, punch-card systems, and said, "Well, the member concept is only going to exist when you introduce a one-to-many relationship and each member can be in many such relationships, unconstrained by this physical phenomenon."

And so we didn't need two mechanisms — one which is physically limited, while the other had no logic limitations.

MANOLA: We have covered quite a wide stretch of territory here: semantic problems to repeating groups. It just seems to me that a lot of this discussion was about the differences between models, ignoring the differences in power which caused these models to be constructed in the first place.

It wasn't a choice between simplicity and complexity. It was a choice between adding some additional objects and perhaps operations which behaved in new ways, ways in which naturally occurring things like relationships and entities behaved; or defining some triggers or some related constraints which forced the relations to operate that way. There's additional complexity in either case.

Unless we get data base systems that can read our minds, there won't be any choice: If we want the system to do more for us, we'll have to tell it more.

DATE: Coming back to something that Frank just said, that there's additional complexity in either case:

Of course, that's true. But I think there are two kinds of additional complexity. One is inherent: You are inherently trying to do a more complicated job. And the other is unnecessary.

My personal outlook on the whole data base field is that everything is so complicated anyway that anything we can do to simplify it, we ought to do. If, to attack a new kind of problem, you introduce a new kind of object and new operators, that will be fine, if the new thing is necessary. If not, then unfortunately you introduce a lot more choice.

I don't mean to pick on Codasyl, but it's an obvious example: In Codasyl, because you have records and Codasyl sets, you always have some choices for a given piece of information in the world. Do I represent it in records or in sets? Often there is a real choice. And I don't really know how to answer that question. Once you've made a choice, you have all the operators that go along with it, all the error conditions and so on. So as far as possible, whenever we can steer away from adding unnecessary complexity, we will, and throw away things we don't need.

MANOLA: I think there is an underlying principle there which is more general, if the issue is simplicity in the objects you're looking at.

To represent some things in relations requires that the user do a relatively large number of operations in order to recover what is essentially one thing. Think of representing a geometric object described in terms of points, or think of describing the sentences and paragraphs of a message and representing that in terms

of relations. I see a number of papers — coming out of IBM research, in fact — which suggest that for many of these applications, some more complex object, at least in the user's view, is helpful in processing those objects because they have inherent complexity.

In other words, the combination of the complexity of the objects the user has to look at and the operations he has to learn in order to operate on these things should be taken into ac-

count. Yes, in a system that allows complex objects there will be more operations, because there are more different kinds of things. But you have to weigh that level of complexity with the level of complexity in manipulations the user might have to do with a system that allows only simpler objects and simpler operations.

CODD: There are applications that do require the manipulation of more

WHAT IS A PRINTER STORE?



THE ONE SOURCE FOR ALL YOUR LINE PRINTER NEEDS.

Only The Printer Store offers a complete line of Band, Belt, Matrix, ChainTrain and Drum printers in speeds of 300 to 1200 LPM, nationwide service, and a full line of ribbons, spares and accessories.

GUARANTEED PLUG COMPATIBLE WITH YOUR SYSTEM.

Every printer we sell is guaranteed plug-compatible with your system via our custom controllers/interfaces.

SAVE UP TO 50% OFF YOUR MINI VENDOR'S PRICE.

You pay less because printers are our only business. We buy in quantity and pass the savings along to you.

COMPLETE SERVICE AND SUPPORT.

Our nationwide, centrally dispatched service network is the largest and

most responsive in the industry. Our technical support team is always ready to solve any special needs.

REMOTE LINE PRINTING ANY WAY YOU NEED IT.

Only The Printer Store has five cost-effective answers to your remote printing needs: RS-232; Long lines; Remote Line Printer System; Remote Batch Printer and Remote Communication Printer. Choose the one that best fits your application.

FAST DELIVERY AND PROFESSIONAL INSTALLATION.

We typically deliver in 30-40 days, and your printer is installed by factory-trained technicians.

SHORT-TERM RENTALS.

Low-cost, flexible rental plans make it easy to handle seasonal peaks or unexpectedly heavy printing loads without destroying your budget.

SHOP BY PHONE FOR RIBBONS, SPARES AND SUPPLIES.

We stock a full line of ribbons, spares and supplies for your convenience. Call (800-243-9054) and we'll ship your order within 24 hours.

WE GUARANTEE EVERY PRINTER FOR 2 YEARS.

With our exclusive "Printer Security Blanket" we pay for all printer service, parts and labor for 24 months.

REFURBS AND USED PRINTERS, TOO.

Tight budget? We'll refurbish your old printer, or sell you a reconditioned printer at incredible savings.

CALL TOLL FREE 800-243-9054*

The Printer Store

Digital Associates Corporation

1039 E. Main Street, Stamford, CT 06902 TWX 710-474-4583
(800) 243-9054 *In Connecticut call (203) 327-9210

IN DEPTH

complicated objects than relations. However, if you have a very large body of commercial applications that can get by with the relational structures and operations, then you should certainly implement the simplest machinery that can do that job first. Then work toward extending that machinery to do the more specialized applications, the more complicated ones.

That's the sequence we're taking. And in none of this business of ex-

tending the model to handle more complex objects or extending it to incorporate semantics as we go *backward* — in the Codasyl direction — by introducing navigation at a lower level!

BACHMAN: I'd like to introduce one thought here. If you look at all the examples in the SQL manual, one of the most interesting facts is that they suppress repeating groups in all printouts. So that if you're dealing

with department and employee, be very careful that you suppress the repeating department code so you look at the employee number. In every example in the manual they print out, they convert data back into structured data from the flat relational model.

CODD: That is *presentation structure*, which should be distinguished very strongly from data base structure, just as input record structure should

also be. Input schemas for your input structures should probably be different from your data base structures. By making the data base as simple as possible and as powerful as possible, you can factor out that input complexity from the data base manipulation and factor out the output complexity also. You have things called report generators for the latter.

BACHMAN: Let me tell you something. What Ted's saying is that you cannot think of information in a single way as in an input and processed local storage, and in the data base. Ted is saying you have to have different things for each purpose. I propose that one data model should be sufficient.

FLOOR: OK, I have an application to discuss: 75 different panels, screen panels. Do you envision an implementation that consists of 75 screen panels implemented one way?

BACHMAN: No. What I'm saying is that one data structure, one conceptual structure, should represent all the structure in all the screens as well as all the structure in the data base. They are just different representations of the same information. (*Codd shakes his head in disagreement.*)

We're distinguishing data from information. One set of information definitions, compatible with many data representations. Do we want to print the same information over and over again — is the customer name needed for each order? I say no, the customer only existed once in the first place, even if he had 14 orders. Flattening the file out may make a simple model for some people to do mathematical expressions on, but I don't think it helps anyone in planning or using a data base.

MANOLA: Can I pin down this argument Ted just used? I always thought that the major argument for the relational model was that the users found flat forms easier to deal with and manipulate and think about than data in other presentation forms. And what I thought I just heard you say was that the presentation can be hierarchical if some users find that easier to deal with, that is, the underlying engine that is simplified by treating data as relations.

CODD: Well, I think you have interpreted "engine" as being the physical data base engine. Obviously, in formulating queries and other transactions, people have to deal with a conceptual view of the data that's stored. And that's what I was really referring to when I talked about the data base engine — the logical data base engine. I wasn't referring to the physical manipulation, the physical structures.

What I'm saying is that in conceiving how to define a particular transaction — unless you're dealing with specialized applications that have

UNIXTM

TRAINING

A Complete Training Curriculum for:

	Management	End Users	Applications Staff	Technical Support	
COURSES	BOSTON	LOS ANGELES	WASHINGTON, D.C.	CHICAGO	TUITION
UNIX Overview	September 21	September 28	November 2	December 7	\$225
UNIX Fundamentals for Non-Programmers	September 22-24	September 29-October 1	November 3-5	December 8-10	\$675
UNIX Fundamentals for Programmers	October 18-20	October 25-27	November 29-December 1	—	\$450
Shell as a Command Language	October 21-22	October 28-29	December 2-3	—	\$675
"C" Language Programming	October 4-8	October 11-15	November 8-12	December 13-17	\$1125

TMUNIX is a trademark of Bell Laboratories.

COMPUTER TECHNOLOGY GROUP—our business is UNIX training. Computer Technology Group UNIX seminars are presented by experts in V7, PWB, SYSTEM III... and beyond. Each instructor is experienced in teaching UNIX as well as in designing and implementing UNIX-based systems.

Mail This Registration Form or Call
(800) 621-3155 or in Illinois (312) 987-4000 8:30-5:00 central time.
to Reserve Your Space Now

Please enroll me in the following seminar(s)

City	Date	Seminar Title	Fee

☐ Our check for \$_____ is enclosed. ☐ Please bill my firm.

Name _____ Title _____

Company _____ Department _____

Address _____

City _____ State _____ Zip _____ Telephone _____

**COMPUTER
TECHNOLOGY
GROUP**
Telemedia, Inc.

310 S. Michigan Ave., Chicago IL 60604

IN DEPTH

pretty complicated objects, like the engineering drawings and so forth for a manufactured part — people generally find tabular structures and the simple slicing of a table, horizontally and vertically, and joining tables very easy to cope with as compared with hierarchical or network structures.

DATE: I'd like to add a little gloss to that. I'm not going to argue that A may be easier than B; you can never win that kind of argument. But you can point to something very concrete: the number of concepts you have to wrestle with; and that is in terms of the logical structure of the data base engine, the data constructs.

The number of data constructs, in turn, affects the number of operators that have to be supported. And when I say operators, I don't just mean the manipulative operators, I mean the definitional operators, authorization operators, integrity operators and so on. There are repercussions throughout the data model. The fewer the data constructs, the fewer the operators. Error messages are another example. And that's something concrete.

BACHMAN: The question of simplification of the data model has certain attractiveness. I wonder, though, if anyone ever thought there might be a level where people start thinking about data.

We talk about concepts such as computer literacy. And I am wondering if the literacy of the computer world is going to walk away from the level of requirements that Ted and Chris are proposing. People are quite capable of learning new, useful concepts and they can deal with the world that has dimensions, values and relations.

Have we exceeded the mental capability of the computer-literate audience we're going to have and which is coming very quickly out of our high schools? I think the answer is no. I think that people will make that little step extra, learn one more concept and find they have far more powerful tools to work with than the relational systems offer and be more comfortable with them.

CODD: On this question of computer literacy, it is certainly possible for a person to be literate in the sense of understanding every structural concept in — and I'll take an IBM system — MVS, and not understand the system as a whole because it's just too big a ball of wax. There are so many instances of Concept A, so many instances of Concept B and so on working in a very intricate way together, that no matter how computer literate you are, unless you spend day after day with such a system, you are unlikely to understand it in a full way.

BACHMAN: I think the example of MVS is very interesting. I would certainly rather learn it if it were de-

scribed in terms of entities, attributes and relationships, than just entities and values.

CODD: By the way, I chose MVS not in the belief that MVS is unique. (laughter)

BACHMAN: I was hoping it was!

WONG: Suppose someone is a current Codasyl user, say, a user of IDMS, working with a procedural

language, and he wants to move in the direction of a high-level compatible query language. But he has a problem: he has a large body of application programs written in the existing procedural DML (Data Manipulation Language).

Let me ask Frank Manola: What migration path would you offer him, to move him in the direction of converting his existing applications to one which is suited to nonprocedural language?

MANOLA: Well, first of all, I would make the observation that as long as the applications continue to work, I wouldn't touch them with a 10-foot pole! The advantage of something that works over something that may not be so obvious that I wonder why anyone would contemplate changing them.

I think there would certainly be strong motivation for going to that kind of access, just as there would be in the relational case. As with SQL,

The 9600 BAUD MODEM For \$315. INTRODUCING THE LCM100*

FLEXIBLE.

The LCM 100 goes wherever you want it to go, because it eliminates the use of expensive RS-232 cables between your computer and other data communication equipment at up to 9600 BAUD, while utilizing in-place power lines on site.

ECONOMICAL.

The LCM 100 saves you money, as a result, because you can put the terminal where it's needed, quickly and efficiently.

EFFICIENT.

The LCM 100 goes where the action is, so instead of tearing up an office, and the staff, to make room for cables and construction, all you do

is plug it in and it is ready to go to work. No mess. No fuss.

RESPONSIVE.

The LCM 100 is ready to expand when you are. Just un-plug it, move it to its new location, and a new

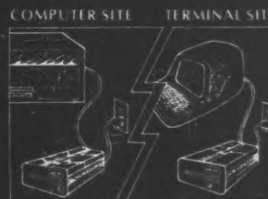
communications link is operational. Simple. Easy. Cost effective.

INVENTORY CONSCIOUS.

The LCM 100 is so versatile, you probably won't need as many terminals as you had planned. You can move it easily, use it anywhere you want and match the job to the person quickly. It will just seem as if you have lots more on-the-job.

PEACEFUL.

Enjoy the sound of silence, with the chattering computer and the patter of the printer tucked away in a closet somewhere. Your staff will appreciate the reduction of noise pollution, more than likely with a significant increase in productivity.



*Line Carrier Modem



THE LCM-100:
WHAT EVERY OFFICE WILL BE USING TOMORROW.
PUT THE FUTURE IN YOURS TODAY!

DEALER INQUIRIES INVITED. ASK ABOUT OUR
SPECIAL DEALER PACKAGE. ORDERS AND
INQUIRIES CALL 1-800-426-0011. ALASKA,
HAWAII AND WASHINGTON STATE CALL COLLECT.

CRC

COMMUNICATIONS RESEARCH CORPORATION

IN DEPTH



BACHMAN: We talk about concepts such as computer literacy. And I am wondering if the literacy of the computer world is going to walk away from the level of requirements that Ted and Chris are proposing. People are quite capable of learning new concepts which are useful concepts, and they can deal with the world that has dimensions, values and relations.

Have we exceeded the mental capability of the computer-literate audience we're going to have and which is coming very quickly out of our high schools? I think the answer is no.

CQLF was designed for embedding in programming languages so that programmers could have set-at-a-time access to their data.

In terms of trying to convert from existing programs to a program, say, with embedded CQLF in it, I would say that about the best you could do is use heuristics — I know of some work going on which is an attempt to do automatic conversion. One looks for the places where people have formed sets of records and tries to find the queries that duplicate the formation.

But I'm really not sure how often there would be an incentive for someone to take an existing application and convert it without there being some enhanced functionality associated with the application that would make rewriting it desirable.

thoughts on the subject of procedural vs. nonprocedural language, and particularly for the existing Codasyl systems?

BACHMAN: Well, I think I interpreted your original question the same way Frank did. That, given a network-type data base which has a procedural language, it's very appropriate that it also have a nonprocedural query language. In fact, I think most of them do. It's also appropriate to have a nonprocedural report-generation language, and most do.

I think that what Frank demonstrated in his work on Network Model 2 was a very interesting example of how you can do query languages against network data base systems. Frank proved the point that you don't have to be procedural to deal with a structured data base. You can have nonprocedural aspects, too.

raised earlier about productivity is tied not only to data models, but more and more to the level of the language that is used to program the applications. Would you agree that in Codasyl systems, the nonprocedural languages could improve productivity?

BACHMAN: I think that nonprocedural languages, first of all, are not nonprocedural. They're languages which have some very high-level functionalities that you can call out. It may simply be RUN REPORT. That's a nonprocedural language. But it's understood very clearly, when a person says RUN REPORT, and the thing runs the report, what it means. The query situation is a very well-

understood operation that can be expressed in terms of one thing after another. To the extent that you can write a complete problem description without some sequential code, I'm all for it.

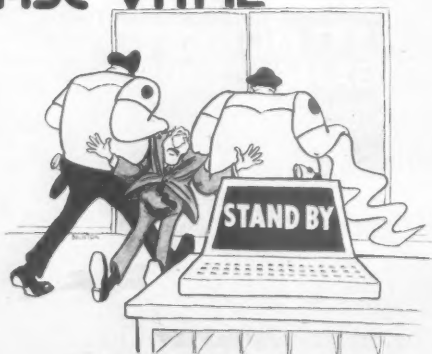
MANOLA: I think I would like to take a different point of view. I happen to think that the ability to have these set-at-a-time operations available is critical, and that the class of data base structures which these operations access should be as general as possible and that that nonprocedural language should be accessible from within programs.

I would suggest that if you are a data base user and/or know some, and if you find that higher level data base languages would be advantageous to productivity, you should write your vendors and insist that they provide them.

FLOOR: How far does one go with this higher level thing? I mean, high-level to one person is lower level to someone else. If someone has to sit in front of a terminal and they want to deal with something related to a purchase order, they want to see a purchase order on the screen. To

WONG: Charlie, what are your **WONG:** The point that Ted Codd

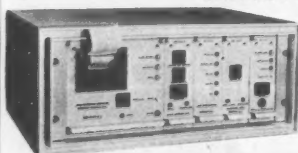
RESPONSE TIME CAN BE VITAL



...B Bu But I'm sure I can find the missing funds just as soon as I get computer responn...

HERE'S HOW TO MEASURE IT:

We manufacture a full line of Response Time and Line Utilization equipment for data communication lines. Our portable and modular rack-mount equipment is capable of monitoring most protocols, including async, bisync and SDLC/SNA.



For further information write or call

QUESTRONICS, INC.

3565 South West Temple Salt Lake City, Utah 84115 (801) 262-9923 TWX 910-925-4000

IN CANADA CALL:

ATELCO (416) 497-2208

See us at T.C.A. Booth # 301

EMULATORS

DATA GENERAL DASHER D200

BASIC IV

IBM 3101/10

TEXAS INSTRUMENTS 911

HAZELTINE 1520

With price, performance, & reliability features of TeleVideo® terminals



Guaranteed Compatibility * Immediate Availability * Low Price

USDATA™

14241 Proton Road / Dallas Texas 75234 / 214-661-9633
TeleVideo is a Registered Trademark of TeleVideo Systems Inc.

IN DEPTH

get something like that from SQL, or some system like that, is quite difficult.

MANOLA: I say the answer ought to be empirical.

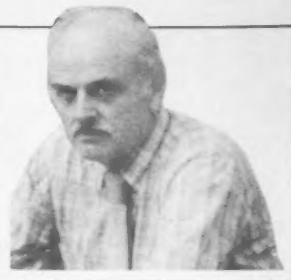
CODD: I would say in two words: No end. In other words, there isn't any end to going higher and higher in the level of language as we progress with the field of computing. That has been the trend and will continue to be. Today Prolog is a good example of a very high-level language. There are even higher level languages than Prolog under consideration.

WONG: As long as you don't pay an excessive price for achieving that higher level. I'm not saying there's any inherent reason for sacrificing performance, but very often the inability to implement such high-level languages efficiently is a deterrent to their use.

CODD: A temporary deterrent, perhaps, until the implementation technology is mastered.

BACHMAN: One thing that people

CODD: On the question of computer literacy, it is certainly possible for a person to be literate in the sense of understanding every structural concept in — and I'll take an IBM system — MVS, and not understand the system as a whole because it's just too big a ball of wax in the sense that there are so many instances of Concept A, so many instances of Concept B, working in a very intricate way together. No matter how computer-literate you are, unless you spend day after day with such a system, you are unlikely to understand it in a full way.



in my company have begun to observe is that when we sell data base systems, communications systems, systems software, we also sell application packages. And the implication of buying an application package from us or from anyone else that produces them is that, because the business transaction forms the language of the system, you don't get involved in data base commands or communication commands. We have to implement them, obviously, using some data base and communication commands, but the customer wants business-oriented results. And so having a purchase-order transaction is a high-level command.

FLOOR: If your application system met every requirement that's out

there, I think you'd find that your system still needs to be tailored for Company A, and for Company B and so on. So in fact it's only one solution for a very small aspect.

BACHMAN: Let me tell you something that's interesting, something that seems to have happened or is now happening. We used to think about selling software to companies that had 30 to 50 programmers. Now we sell software to companies that have a big IBM machine and four application programmers. They can't afford a systems programmer. They can't afford more than four application programmers.

And so they say there are two ways you can do this: You can tailor an application package to the business or you can tailor the business organization to make it meet the application package.

FLOOR: I'm terrified of this concept of tailoring business organizations. Are we all going to be the same?

BACHMAN: If you're in the savings and loan business, how different is your savings and loan bank from the one on the next corner down the street?

FLOOR: Well, six months ago it was quite different, but I can see where you're heading me... (laughter)

BACHMAN: We're only following

the current marketplace requirements. We're not leading it. They're saying, they don't want to invest in application programmers. They want to invest in selling their customers, people who deposit in the bank or withdraw, they want to put their skills at that end — not at the data processing end.

WONG: I don't think I would accept the characterization of application programs as a substitute for high-level languages.

CODD: Yes, well, even if you had application generators or packages that satisfy a large number of applications, nevertheless, as the culture develops and customs change, you're going to have to change these packages — as the vendor. As a vendor, I won't want to invest a lot of money in changing the low-level code inside these packages. I want to be able to manipulate these packages very readily. So high-level languages are a necessity for the vendors to keep these application generators up to date.

BACHMAN: Do you imply that relational languages are high-level languages?

CODD: I didn't say anything specifically about relational languages. However, relational languages are

With These New Books from Lifetime Learning Publications

STAY ON TOP

Packet Switching: Tomorrow's Communications Today
by Roy D. Rosner • 371 pp. • hardbound • \$34.00

Detailed, up-to-date information on packet switching: topological design considerations, the X.25 protocol, switching technologies, voice, data, video and facsimile transmission, plus much more.

Distributed Telecommunications Networks: Via Satellites and Packet Switching
by Roy D. Rosner • 256 pp. • hardbound • \$29.95

Technical and managerial insights into the development of distributed telecommunications networks. Focuses on their relationship with packet switching, satellites, local networks, voice and non-voice telecommunications and more.

Writing Handbook for Computer Professionals
by William D. Skees • 296 pp. • hardbound • \$26.00

A comprehensive writing manual exclusively for the computer professional. Includes techniques for effective correspondence, vendor surveys, manuals, and promotional presentations. Organized for quick reference.

How to Write Computer Manuals for Users
by Susan J. Grimm • 211 pp. • hardbound • \$18.95

A detailed guide for helping technical writers research, plan, write, review, produce and maintain manuals that users can really understand.



ORDER FORM

Please send me the following book(s) to examine FREE for 15 days. If I decide to keep the book(s) I will send you my check/money order for the purchase price plus shipping and handling. Or, I'll return the book(s) and owe nothing.

☐ Packet Switching, \$34.00

☐ Writing Handbook for Computer Professionals, \$26.00

☐ Distributed Telecommunications Networks, \$29.95

☐ How to Write Computer Manuals for Users, \$18.95

Signature _____

Address _____

Name _____

City, State, Zip _____

For VISA and MasterCard orders call now toll free: National: 800-824-7888, California: 800-852-7777, Alaska and Hawaii: 800-824-7919 • Ask for Operator 797 •

Send orders to Lifetime Learning Publications • 10 Davis Drive • Belmont, CA 94002

Residents of CA, KY, MA, MI, NJ, NY, NC, and WA, please add sales tax.

ZEKE—The Controller

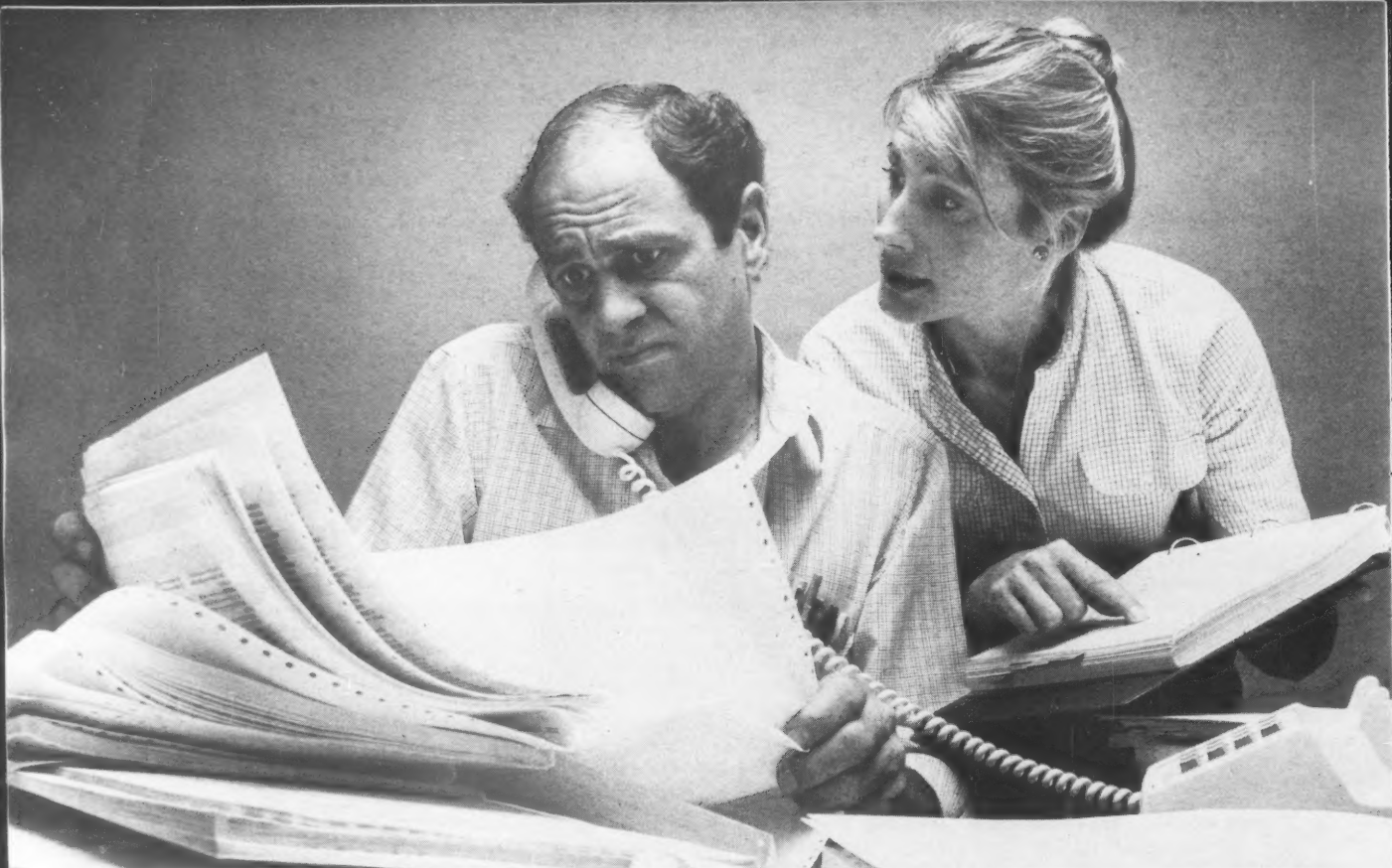
Automates the scheduling of your computer

NOW YOUR DOS/VSE SYSTEM CAN REMEMBER WHAT JOBS TO RUN, WHEN TO RUN THEM, PLUS ALL THE REQUIREMENTS AND PREREQUISITES FOR THE RUN.

SOUTHWEST SOFTWARE

Southwest Software Services, Inc.
3602 East Randol Mill Road
Arlington, Texas 76011
(817) 640-8911

- ★ Automatic job submission
- ★ Batch scheduling reports
- ★ CICS Interface
- ★ VM/CMS interface
- ★ Conditional JCL
- ★ Multi-CPU support
- ★ Much more . . .



Oh, the joys of being a dp professional.

It's always been easy to tell when a job runs wrong. But it's never been an easy task to find out how to put it right.

You can waste countless hours trying to find the answer; searching through out-dated run books and other documentation.

And all the while you're looking, the clock is ticking.

The schedule goes out the window. Your operating costs go up again. Unhappy users get fed up with waiting and start calling. And your staff gets frustrated putting out fires.

All because there's never been a cost-effective program to help you manage production failures.

Until now.

The solution's in sight

Triangle Software's new ProDict™ program will help you manage all

the complexities of Production System Management faster, easier, better than you ever thought possible.

It's made possible because our ProDict program is an active, automatic, on-line dictionary of all your production jobs, data sets and programs.

Input to ProDict software is automatic, from JCL at production turnover time. And the output is accurate production documentation—on-line or hard copy—better scheduling, reliable contingency planning, and faster disaster recovery.

Cut costs in half in just half-an-hour

The ProDict software package is easy to use. With no more than 30 minutes effort, you can have it working for you, because it requires no changes to the stan-

dard JCL you're working with now.

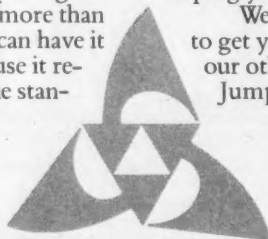
Our ProDict program can save you countless manhours, even mandays, now wasted manually searching listings to validate a change to a job or a data set. It can halve your costs of production system maintenance. And it will give you concise, up-to-the-instant, accurate information to make decisions your company can depend on.

Improve productivity with ProDict software now

For all the information about all that our ProDict program can do for you, call or write us, right now.

We truly understand your problems, and we are intent on helping you solve them.

We welcome the opportunity to get you doing exactly what our other customers are doing: Jumping for joy.



Triangle Software Company

2651 Kentworth Way, Santa Clara, CA 95051 (408) 727-4391

IN DEPTH

high-level. I'm not saying that relational languages are in any sense an ultimate in level.

BACHMAN: Well, are you saying they're higher languages than network languages?

CODD: Yes...

BACHMAN: Well, you're entitled to your opinion.

CODD: Yes, I found this true of Network Model 1. That was before Frank Menola and Alain Pirotte came out with Network Model 2. Remember, the model is more than the structures. It's the structures plus the operators.

FLOOR: Following up on this topic of high-level languages, it seems that when we look at the programming language environment, high-level languages have been traditionally languages like APL, which works on the basic data type of the array, and Lisp, which works on the basic data type of the B-tree, or the binary tree.

So I'm just a little curious: Why is it, in the relational model, you saw fit to embed this high-level data access into host languages such as Cobol and Fortran that were clearly designed for more procedural-level code, as opposed to taking the approach of Nomad or Focus?

CODD: I can explain that as a historical thing. I was once concerned with the formal definition of PL/I. Not centrally concerned, but somewhat concerned. And at that time, the IBM Vienna Laboratory was the primary agent concerned with coming up with a formal model for the semantics of PL/I.

When they did that work, they uncovered more glitches in PL/I than all the users that existed at that time and all the compiler writers that existed at that time! And three compilers were under

construction, at the very beginning.

So they wanted, and certainly I wanted at the time, to introduce changes to the definition of PL/I. There was, however, a language control

board whose main function was to preserve the language and prevent changes!

The difficulty of getting changes in the definition of PL/I, in the definition of Cobol, in the definition of For-

tran, were severe at that time. Therefore, I went off to San Jose and I said, "I'm not going to define a new language nor am I going to define changes to PL/I to incorporate set processing. I'm going

to define something called a data sublanguage, and that's going to interface with PL/I, Fortran and Cobol." It was just not practical or feasible at that time to get the necessary changes made in the

Get control of your training investment for just \$395 a month

Employee training is a big budget item. Stay in control with the NEW PHOENIX PRESENTATION SYSTEM. It has all the proven advantages of computer-based training (reduced training costs and improved worker productivity), PLUS a purchase option that gives you more control of your training investment.

The PHOENIX PRESENTATION SYSTEM IS:

- **LOW-COST** — \$395 a month lease fee is a 60% savings for those who do not currently require an authoring capability.
- **FLEXIBLE** — The first six months lease fee is applicable to purchase of the complete PHOENIX System which includes author mode should your needs change.
- **COMPATIBLE** — Works with all IBM CBT courses. In addition, all DELTAK and ASI computer-based training courses are available in PHOENIX format. Works on existing IBM hardware already available in your company.
- **MORE EFFICIENT** — Additional functional benefits include LOWER CPU USAGE, LOWER DISK SPACE REQUIREMENTS, AND SIMPLER INSTALLATION than other CBT systems.
- **DEPENDABLE** — Backed by Goal Systems' proven record of technical support.

Get control of your training investment. The PHOENIX PRESENTATION SYSTEM gives you easy, cost-effective entry into computer-based training with the option to step-up when your needs grow. Call now 1-800-848-4640 (in Ohio call 614-888-1775) for the best bottom line return on your training program. Free trial available in your shop.



THE PHOENIX SYSTEM



Goal Systems International Inc.

Insure your success... software solutions by Goal.

5455 North High Street
Columbus, Ohio 43214

ELECTRONIC MAIL

For IMS DB/DC

Also other data base packages:

- Tables Handling
- Personnel Directory
- Daily Mail Control

Call or Write:

Chet R. Switala
D.B. SYSTEMS, INC.
Two South Patton Ave.,
Arlington Heights, IL 60005
Tel. (312) 870-8665

For more information about The PHOENIX System, clip and return:

We expect to make a decision about CBT:

- ☐ Within 2-6 months ☐ Within 6-12 months
☐ Plans Indefinite

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Telephone () _____

CPU _____ Operating System _____

IN DEPTH

languages that were either widely used or about to be widely used.

FLOOR: Given the success of languages like Nomad and Ramis and Focus, does that at

all change your opinion at this time?

CODD: No. Nomad came along at least five years later — 1974, I believe. Something like that. Maybe '75. And it

has not been integrated well with PL/I, Fortran and Cobol applications, to my knowledge, because it is a completely separate language, you see.

Now, it's found a nice mar-

ket — and if I had invested in that, or if you had invested in that, I think it would have paid off well. But I'm working in a company whose main market was with the principal host languages.

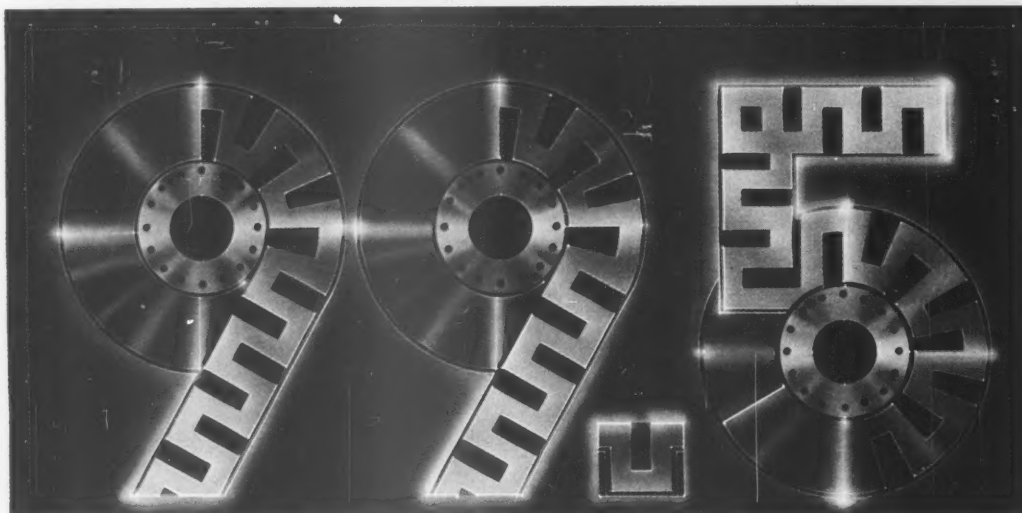
That wasn't something we'd do.

WONG: I would like to direct my next question to Charlie Bachman. Let's assume that in the current Codasyl implementations, there is a close coupling between logical structures and their physical realization. Doesn't that make it difficult to improve on the performance of the system without impacting existing programs?

BACHMAN: I think I would agree with you that most implementations of network systems today have a fairly close correlation between the logical set concept and the set implementation technique which underlies the linked lists.

It is not a situation, though, which means a change in set implementation technique would affect functionality. Taking the example that we typically see for relational systems, where each of the employee records happens to have a department code, I'd say that's a second implementation technique for a set. Because all the required information is there. So if someone wants to find the first member, i.e., the first employee of that department, the next and the next, or find the owner of the set, then the DBMS can return the desired result.

That's two clear implementations. In the literature there have probably been about 10 different imple-



Data 99.5% pure.

— Now digital data communication of guaranteed accuracy and unprecedented reliability is available in more than 350 cities.

It is DATAPHONE® Digital Service, a major development of the Bell network, the world's largest and most advanced information management system.

With DATAPHONE Digital Service, your data system handles more data, clean data, day in and day out. Bell guarantees better than 99.5% error-free seconds transmitting at 56,000 bps and even greater accuracy at slower rates. Reliability is designed in. If needed, troubleshooting and service are handled quickly by the Bell System from a central location. You get more use from your system without adding costly hardware.

When your system is digital from end to end, there are no losses of quality due to signal conversion or amplification. Re-transmission is virtually eliminated.

You'll find that when your data system is more efficient, accurate and reliable, you can respond faster, serve your customers and users better, manage better.

◆ Discuss with Bell how DATAPHONE Digital Service can serve your needs. All you have to do is call now, 1 800 821-2121, toll free.

1 800 821-2121

Put our knowledge to work for your business. — Bell System.

The knowledge business



Retro-Graphics* and VT-125** Users

Get CRT display copies fast and conveniently from your LA-120** with DECPLLOT. Includes dot-for-dot compatibility for distortion-free hardcopy...so circles remain circles. Up to 165 dot per inch resolution for only \$595...or full color graphics for only \$995.

Fits all popular graphic CRT's.

Available now from Texprint or DEC distributors.

*Registered trademark of Digital Engineering, Inc.
**Registered trademark of Digital Equipment Corp.

TEXPRINT

TEXPRINT, INC.
8 Blanchard Rd.
Burlington, MA 01803
(617) 273-5784

IN DEPTH

mentation techniques using binary trees, using n-ary trees, to implement sets. It turns out, though, that the one that was first used, the linked list, happened to be a very efficient technique.

I think that as we move along in the data base technology, we will find that data base administrators will have more and more set implementation techniques at their access to choose from for various performance reasons, and that they can choose them and change them from time to time to optimize both the computer resources and the data storage resources.

WONG: I think, Charlie, it's a departure from the traditional philosophy of Codasyl to detach the logical from the physical to the extent that you do.

MANOLA: I think that this

is a departure from the classical implementation of the Codasyl systems and a departure from the classical way in which many people have talked about those systems. I don't think it's necessarily a

departure from the Codasyl philosophy itself.

I think that in the past there certainly has been the bundling of logical and physical. I think it would be difficult to argue against that. But I

think that given the data base architecture which Codasyl started out with, where there was only one data description, you naturally cluster those physical declarations that you were able to

make easily next to the logical declarations, which makes sense. And when what you're doing is logical clustering of records in the sense of forming group-related objects, you naturally

SCIENCE/SCOPE

For his pioneering contributions to geostationary communications satellites, Dr. Harold Rosen of Hughes has been given the prestigious Alexander Graham Bell Medal by the Institute of Electrical and Electronic Engineers. Rosen is credited with conceiving the first practical geostationary communications satellite, which orbits 22,300 miles high and appears to hover in the sky. A single satellite covers over a third of the globe. Early satellites orbited at low altitudes and would have required a large orbiting fleet and complicated tracking procedures if continuous communications were to be provided.

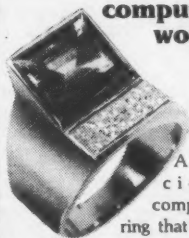
A complete 3-D microelectronic 32x32 array processor is significantly closer to being demonstrated now that Hughes scientists have fully interconnected a stack of two wafers. Each of the wafers has a 32x32 array of aluminum feedthroughs migrated through the silicon wafer, forming low resistance paths across the wafer. Micro-spring bridges made for each unit cell of the array connect one wafer to the other. Improvements in fabrication and assembly techniques led to a performance yield on bridge/feedthrough interconnections of better than 99%.

Scientists have tracked the ash plume from the Mexican volcano El Cinchon with the aid of a weather satellite. Daylight and infrared pictures from GOES-5 (Geostationary Operational Environmental Satellite) clearly showed the April 4 eruptions even from 22,300 miles in space. Subsequent images revealed the plume rising high into the stratosphere and across the Yucatan peninsula. The dust now rings the planet in a wide band. Because El Cinchon blew far more dust into the stratosphere than did Mount St. Helens in 1980, scientists are speculating on the volcano's long-term effects on world climate. GOES-5 was built by Hughes and is operated by the National Oceanic and Atmospheric Administration.

Through intimate teamwork between engineering and manufacturing functions and ever-increasing use of computers, electronics firms are boosting productivity even as their products grow more technically advanced. Computer-aided design and manufacturing routinely offer productivity improvements on the order of 4-to-1, and sometimes as high as 10-to-1. Furthermore, locating engineering and manufacturing together fosters the technical sophistication needed to design and build high-technology products. Hughes has stressed this philosophy in its five-year capital investment program by devoting nearly half of the total \$1.5 billion for merging manufacturing and engineering. One new facility supports advanced electro-optical products. The complex, covering 1.75 million square feet, is one of the largest and most sophisticated structures of its kind.

Career growth opportunities exist at all levels at Hughes Support Systems for a variety of engineers qualified by degree or extensive work experience. They include systems engineers and software and hardware design engineers for major simulation and test equipment programs. Also, field engineering posts throughout the U.S. and the world offer travel, autonomy, and responsibility for the life cycle of Hughes electronics systems. Phone collect (213) 513-5235. Or send your resume to Professional Employment, Dept. SE, Hughes Aircraft Company, P.O. Box 9399, Long Beach, CA 90810-0463. Equal opportunity employer.

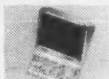
A symbol of achievements in your computer world



A precious computer ring that contains 10 grams of 14K

solid gold, no chips but 10 fine diamonds totaling 1/3 carat... while the screen reveals your birthstone color. It's a companion that will never let you go broke. Tie Tac also available in 10 and 14K gold with 8 diamonds.

Tie Tac



MAB JEWELERS

Providence & Springfield Roads
Aldan, Pa. 19018 (215) 623-8009

Ring			
<input type="checkbox"/> 10K 10 Diamonds	15 Pt.		\$350
<input type="checkbox"/> 14K 10	30 Pt.		\$595
<input type="checkbox"/> 18K 10	1/2 Ct.		\$795
Indicate ring size and desired birthstone			
<input type="checkbox"/> Tie Tac			
<input type="checkbox"/> 10K 8 Diamonds	12 Pt.		\$265
<input type="checkbox"/> 14K 8	1/4 Ct.		\$495

Name _____
Address _____
City _____ State _____ Zip _____
Account No. _____

Pa. residents please add sales tax. All major credit cards accepted. allow 4 to 6 weeks for delivery.

Creating a new world with electronics

HUGHES

HUGHES AIRCRAFT COMPANY
CULVER CITY, CALIFORNIA 90230
(213) 670-1515 EXTENSION 5964

IN DEPTH

want to associate with that logical construct a physical declaration which says, "OK, given that we've just done that, put them close together." Now, as data base architectures tend to grow to the point where you're separating those sorts of things, you see the data declaration changing as well.

WONG: Chris?

DATE: One of the advantages of sets

is that they provided physical clustering. But it's not clear to me, though, that you need sets to achieve physical clustering. What you need is the ability to store one record physically close to another. You can do that with a relational model or anything else, it seems to me.

WONG: Unless there is a one-to-many relationship, it's hard to design the structure, in terms of what you store next to what.

DATE: Oh, well let's see if I can give you an example in terms of departments and employees. I don't see why an employee record can't be stored on the same physical page as the department record matching that employee record on department number. This can be done with SQL/DS. Not very straightforwardly, but it can be done.

BACHMAN: I'd like to give a clear example I think everyone would un-

derstand, showing the very clear separation between the logical notion of set processing and the physical notion and how it's implemented. Essentially there are three statements that are set manipulators: (1) commands to find the first and next continuing in the set, (2) commands that will find the last and prior continuing backwards around the set and (3) commands used when I want to move from a member to the owner. Three distinct concepts of access.

Now in all the implementations I am familiar with in detail, even if you created a linked list with only a forward pointer from the owner to the first member to the second member to the third member to the fourth member, all three access methods work. They take a little longer in some cases than if the linked list had "owner" positions and "prior" positions. So this states a very clear separation between the functionality and the implementation.

If you said, "Find an owner," if there was an owner pointer, it would go directly. If not, it would go to successive members and eventually find the owner. This is a clear example of the separation of the logical access method and the physical structures implemented.

WONG: Let me move on to the next question, which I would like to direct to Chris Date. It is often said that the relational model is ideal for retrieval — high-powered, high-level operators, relation-at-a-time operators — but it is poorly suited for updates. The problem is the following: There are updates that are natural updates; they are not removal or insertion of tuples, but removal or insertion of entities. And the consequence of such an update is the propagation of updates throughout the data base. Unless there is a vehicle to support such propagation efficiently, the cost in overhead may be high. What is your comment?

DATE: I need to retreat, first of all, into the old differentiation between the model on the one hand and the existing systems on the other. The model as originally defined had some provision for the kind of thing you're talking about. For example, if you tried to delete a department, and

Give us 10 minutes and the answers to 25 simple questions... and ESTIMACS® will deliver a reliable time estimate for your mainframe software system development project... save your company thousands of dollars... and make you a SOFTWARE HERO!

Take the guesswork, confusion and disappointment out of software system development estimating with the industry's first and only system that quickly generates estimates of time, cost, staffing, hardware and cumulative resource needs and risks for your system development projects.

That tool is ESTIMACS, and it's been tested and proven in busy DP operations at a number of the Big 8 accounting firms, major insurance companies and manufacturers. Now it's available for you, to help the system developer and system user construct and analyze initial project effort estimates in a short period of time (typically 10 minutes) based on answers to 25 simple questions (see box at right), and then develop alternate estimates through successive refinement and analysis of design tradeoffs using a series of "what if" type questions.

Designed for convenient use by software management and user personnel, ESTIMACS is available on Apple microcomputers and IBM Personal Computers. Utilizing color graphics to clearly demonstrate relationships between inputs and forecasts, ESTIMACS will provide meaningful estimates — using a model constructed from a series of recognized industry data bases — of software development in terms of total effort hours, manpower needs in terms of personnel at each skill level over the software project life cycle, and related costs — hardware configuration requirements in terms of total effort hours, and cumulative resource needs, related costs, and relative risks of concurrent projects.

Try ESTIMACS. All it takes is 10 minutes, and answers to 25 questions. The rest is up to ESTIMACS. And to you.

Answer the 25 questions at the right and then call MACS toll free

800-523-0669

(in PA, call 215-648-0730)

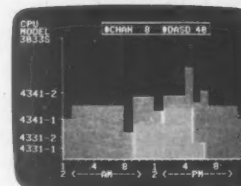
to get a free estimate of effort hours for your software system development project.



Effort



Staffing



Hardware



Portfolio

ESTIMACS provides interactive color graphic screens to help you visualize your software system development requirements, working from these 25 simple questions —

QUESTIONS	ANSWERS
1. How many user organizational units will directly participate?	
2. How many sites in cities other than the developer's will be involved?	
3. How many people in the user organizational units are involved?	
4. How familiar is the development group with this business application?	
5. What is the level of user management agreement on system objectives?	
6. What will be the average travel time to involved sites?	
7. Will any non-developer staff be on the application development team?	
8. How many people might conceivably be relocated for this effort?	
9. How many major business functions are being implemented?	
10. How many unique logical business inputs will the system process?	
11. How many unique logical business outputs will the system generate?	
12. How many logical files and/or data bases will the system access?	
13. How many major types of on-line inquiry are envisioned?	
14. Will the user's knowledge of data processing aid the application effort?	
15. What % of proposed business functions does the user already perform?	
16. What percent of these are already automated?	
17. Is a system of this type in operation anywhere?	
18. Will the operational environment be distributed, on-line, or batch?	
19. Is this a critical business system?	
20. Is a back-up system being developed?	
21. Will the system require any special disaster-recovery mechanisms?	
22. Will performance or load levels be specified as explicit design criteria?	
23. Is the proposed system primarily batch, on-line, or real-time?	
24. Does the processing logic seem to be simple, average, or complex?	
25. Will automated error detection and correction be required?	



macs / management and computer services, inc.
great valley center / valley forge, pa 19482 / 215-648-0730



A subsidiary of Pentamotion Enterprises, Inc.

'Shirtsleeves' Productivity
SYSTEMS DOCUMENTATION, INC.

Writing and preparation of:
USER MANUALS,
SYSTEMS/PROGRAMMING
MANUALS, OPERATIONS
GUIDES/RUN BOOKS,
AND OTHER RELATED
TRAINING MATERIALS
AND DOCUMENTATION



222 Bridge Plaza South
Fort Lee, NJ 07024
(201) 592-8745 (212) 724-8065

IN DEPTH



MANOLA: I'm really not sure how often there would be an incentive for someone to take an existing application and convert it without there being some enhanced functionality associated with the application... I would make the observation that as long as the applications continue to work, I wouldn't touch them with a 10-foot pole.

ciency. I'd like to see it fixed as soon as possible.

So, in answer to your question, there are some basic model facilities which have not been implemented — but I don't regard the basic model as fundamentally unsuited. It's just that systems haven't yet done the job.

BACHMAN: I'd like to add one comment. It didn't seem to me that the mechanism you described required any heavy overhead, either.

DATE: Oh yes, thank you, Charlie. Yes, I don't see why there is necessarily overhead. The implementation techniques that applied with systems like IMS can well be used to support relational systems. As a matter of fact, I met a guy last week who was building a relational prototype in England and he has implemented all those ideas I mentioned in a very

nice way, which, however, I can't discuss now.

WONG: Let me ask one final question: Data bases are notoriously difficult to design. The problem is not only one of expressing the data in logical definition structures, but to anticipate changes that might occur in the schema and the problem of designing the physical structures for it. It has been said — not by me — that relational systems are particularly ill-suited for physical design because the global structures are difficult to discover. Would you comment?

CODD: Well, I could say briefly that domains — which have been under-emphasized in talking about our relational model, and neglected very much, except in IBM's QBE (Query-By-Example) and in a few other implementations — domains provide strong clues as to what sort of trans-relational access structures might well be implemented. It's important to distinguish primary domains that collectively correspond to the E-Domain of the extended model RM/T from the other domains, domains of mere attributes, that are non-E-like, for example, the attribute QUANTITY ON HAND.

Not too many people are interested in finding all the occurrences of 3 as the quantity on hand. But a lot of people are interested in finding all the occurrences of 3 as a supplier serial number.

WONG: Let me rephrase my question. What tools do you think we need to design the data base, and what tools exist now in relational systems?

DATE: I'd like to say something to that. It seems to me that relational systems (it seems to me we're talking about the physical level of design) are both easier and harder. They're easier in the sense that we have really more decoupling of logical and physical, and therefore even though you may get the physical design wrong, you can tune later without affecting the logical level. So, you can do a sort of incremental physical design. And that's a good thing.

The bad thing is, to make the system work well at all, you have to have some kind of optimizer — as SQL/DS does, for example — and the whole essence of an optimizer is that it's doing things you don't understand.

The optimizer is going to take advantage of indexes. And you don't know how it works! So you may try

and guess what indexes, for example, to put in, but you don't know if you're guessing right. So it really becomes very important to have a physical data base design aid which works hand in glove with the optimizer and tells you where is a good place to put indexes.

There was a project going on recently at San Jose Research at IBM to build exactly such an optimizer. The point is, you do have freedom to change things, but you also really do

"When You Want To Be First, Every Second Counts"



InfoWorld is the only microcomputer newsweekly. Our readers are intelligent professionals who

depend on the up-to-date coverage InfoWorld delivers.

InfoWorld's classifieds work. Readers respond more readily to ads appearing in a weekly publication because they assume that the job opening is recent, and they want to be first in line.

Here's what one of our classified advertisers says:

"The response has, and continues to be overwhelming. I have run full page color advertisements in many of the larger computer publications without the success I have had with the classified ad I placed in InfoWorld."

Palmer T. Wolf
Advanced Operating Systems
Howard W. Sams
and Co., Inc.
A subsidiary of ITT

Get the results you want.
Advertise in the hottest micro magazine — the only micro-computer newsweekly.
InfoWorld consistently delivers!

InfoWorld
The Newsweekly for Microcomputer Users

Contact: InfoWorld,
Classified Ad Department,
530 Lytton Avenue,
Palo Alto, CA 94301
(415) 328-4602
or call (800) 227-8365
from outside California.
Toll Free

NEW SOFTWARE SIMPLY SOLVES PROBLEMS FOR IBM USERS.

INTRODUCING THE ONLY COMPLETELY INTEGRATED OPERATIONAL AND GENERAL ACCOUNTING SOFTWARE PACKAGES EASY TO INSTALL AND EASY ON THE BUDGET.

Now, existing software packages are out on three strikes.

Too complex. Too costly. Not completely integrated.

Now, it's a new ballgame. Because Lawson Associates offers the first and only completely integrated operational and general accounting software packages specifically designed for IBM 43XX and System/370 computers that are also reasonably priced and quickly installed.

Our secret? Simplicity. Each package is complete and state-of-the-art, but minus expensive unnecessary. And you get our software experience, further facilitating installation and startup. Plus, all these functions and features.

For more information, on these or System/38 software, please call or write:

NATIONAL SALES:
Tim Donaldson
Vice-President of Marketing
Lawson Associates
2021 East Hennepin Ave.
Minneapolis, MN 55413
(612) 379-2633

LAWSON ASSOCIATES
WE SIMPLY SOLVE PROBLEMS

INTEGRATED MODULES:

Those available include: General Ledger and Report Writer/Accounts Payable/Accounts Receivable/Inventory Control/Order Entry/Fixed Assets/Payroll/Purchase Order/Equipment and Vehicle Maintenance.

DESIGN FEATURES:

They include: on line systems using data base management concepts; user friendly programs written in COBOL and CICS; and integrated modules.

SERVICE FEATURES:

Fully documented and supported. Onsite training and implementation. One year warranty. Available now for immediate installation.

IN TEXAS:
R.L. Turner
Software Sales Manager
Lawson Associates
5001 LBJ Freeway, Suite 175
Dallas, TX 75234
(214) 233-4474

SEE US AT SOFTWARE/EXPO
CHICAGO, SEPTEMBER 21-23. BOOTH 1059

IN DEPTH

need a physical design aid.

BACHMAN: Could I respond to your question? I would have started not at the physical design but at the logical or, even better, the conceptual design level. At this level you're not trying to design a data base; rather, you're trying to understand the information which exists within a business. Such an approach is being studied in a number of places, and all have received their focus from the

reports of the Ansi/Sparc Study Group on Data Base Systems. They first define what is called the "conceptual schema." Essentially it is a description of the enterprise which does not have any data packaging constraints.

Some of this data may be in the computer, some may be in the manual files and some just in people's heads. And I think this is an essential starting point if you're going to make an improvement. We are not asking

which data model we are going to use — we are asking that we start someplace else. Given that you can get the description of the enterprise you're dealing with, you can go from the conceptual design to the logical design level by saying what information we want to keep in each data base. You make that step with computer-aided assistance. You sit and check off "Yes" or "No" to system-asked questions.

You can also go from the logical de-

sign to the physical design level with computer-aided assistance, if you have collected the necessary operations statistics: "How many people are we keeping track of? How many customers? How many parts, how many products? And what member distributions are in the relationships? Whether the customer buys one thing or 10,000 things per order, will it make a difference in how the system is going to behave?"

Step by step, you can move down from the top and get a good solid foundation using the conceptual schema as the starting place.

CODD: Charlie, talking about the conceptual schema, makes it sound like you can define the objects in your enterprise and the relationships amongst them without having some representation model at all. Now perhaps I'm misinterpreting what you said . . .

BACHMAN: Ted, what I tried to say is that you have to represent it in some model. The current issue is not whether you represent it relationally or in network sets, but the fact that you first set out to represent the enterprise. Now you are going to have to decide what data model to use. The answer to my question is not what decision to make, but where to start — not by describing the data base, but by describing the information that's pertinent to the enterprise.

CODD: Now, I'll have to agree there!

About the Debate

This debate was part of Data Base '82, a portion of the Wang Institute of Graduate Studies' short summer course, the Eastern Institute in Computer Science. Data Base '82 was organized by Prof. Michael Stonebraker, University of California, and directed by Dr. Nancy Martin, the Wang Institute, both of whom assisted greatly in bringing this debate to publication.

The presentation was organized and edited by Catherine Marèngi, Computerworld's senior editor, features. Lois Paul, senior software editor, provided support and consultation.†

An urgent message from: James Martin

To: 400,000 Programmers throughout North America

DON'T ALLOW JAPAN TO DECIMATE THE COMPUTER INDUSTRY . . .

... As they seem to have done to the automotive and consumer electronics industries

HUGE APPLICATION DEVELOPMENT BACKLOGS are occurring throughout North America. There is a SEVERE SHORTAGE of experienced programmers already being felt by business, industry, and government DP shops. PROGRAMMERS, YOU ARE A CRITICAL NATIONAL RESOURCE — THE ONLY GROUP THAT CAN BOOST PRODUCTIVITY by any measurable degree. But, to do this you MUST apply the latest techniques available (COBOL won't do). You must start using Application Generators and other fourth generation methodologies.

Two case studies of end users who are achieving spectacular productivity gains

1. A government department put together a team of end users to develop a forestry management system using an application system generator called UINC. The team consisted of four end users who completed the design, testing, and implementation in three months. The government department had been waiting for eight years for the conventional data processing department to do exactly the same job.
2. A diversified trading company, who has interests in merchandising, insurance, automobiles, and liquor, installed a mini-computer for the first time. They installed 21 separate applications in 18 months using fourth generation languages. Many of these applications were implemented by end users. Others were implemented by the DP Department, which consisted of one DP manager, one programmer, and one operator.

A 5-DAY SEMINAR

October 18-22, 1982	Santa Clara
October 25-29, 1982	New York
November 8-12, 1982	Toronto
November 15-19, 1982	Atlanta

It is your responsibility to learn, introduce, and use these new tools in your organization. Without them we have little chance of surviving the rampaging foreign competition.

APPLICATION DEVELOPMENT TECHNIQUES are now changing beyond recognition. You cannot achieve the results your top management needs with so-called structured variants of old techniques. You must make yourself more powerful in achieving results.

Learn the newest techniques which are taught at . . . The James Martin Seminar

Fourth Generation Methodologies: The Productivity Seminar

It's not just an idle phrase . . . it's happening. DP departments around the world are applying Martin's techniques.

Call or write for further information
(213) 394-8305

Please send me more information on
The James Martin Seminar

NAME

COMPANY NAME

ADDRESS

CITY/STATE/ZIP

TELEPHONE

CW-911

TECHNOLOGY
TRANSFER
INSTITUTE
761 10th ST. SANTA MONICA, CA 90402 (213) 394-8305

IMS-ADF TRAINING

ADF Basic Workshop
ADF Overview for Managers
ADF Special Features

Call: (516) 536-3264
or

Write: BABB COMPUTER ASSOC
333 N. Village Avenue
Rockville Centre, NY 11570

System Gives Users Ability To Tie Many DDP Systems

HARVARD, Mass. — Xyplex, Inc. has introduced a computer system that reportedly provides users with the ability to connect a wide range of computer systems performing various distributed processing functions.

The systems can range from personal business computers, word processors and small laboratory systems to mid-range time-sharing systems and large mainframes, a Xyplex spokesman claimed.

The Xyplex system's integrated front-end processors maximize communications speed and computer capacity while eliminating direct cable connections between terminals and computers, the spokesman said. The front-end function reportedly removes the terminal-handling burden from the host computer, including character echoing and special character recognition.

Local Environments

Within a local environment (a building or campus), a single cable is used to connect all the terminals and computers, allowing any terminal user to access the computers or terminals. Interbuilding connections are provided by gateways using telephone lines, private microwave channels or fiber-optic links, according to the spokesman.

The first two components of the system to be available are the XP-UN64-A Unibus host interface unit for Digital Equipment Corp. VAX-11s and PDP-11s running under VMS and RSX and the XP-CC8-A terminal cluster controller, which provides connections for up to eight terminals. The XP-UN64-A costs \$9,500 and the XP-CC8-A, \$5,600.

A one-per-customer software license fee for RSX- and VMS-based host interface units and the cluster controller software is priced at \$800 each, Xyplex said from Oak Hill Road, Harvard, Mass. 01451.

Communications Processor Emulates 3274-51C Controller

MIAMI, Fla. — Innovative Electronics, Inc. has introduced a communications processor that is said to emulate an IBM 3274-51C communications controller.

The processor converts a Digital Equipment Corp. VT100-compatible terminal into a full-function IBM 3277-1, 3277-2, 3278-1, or 3278-2 terminal communicating with the IBM host using Ebcidic binary synchronous communications, a spokesman for Innovative Electronics said.

Study: 'Greatest Amount of Activity' Focused on Local-Area Micro Nets

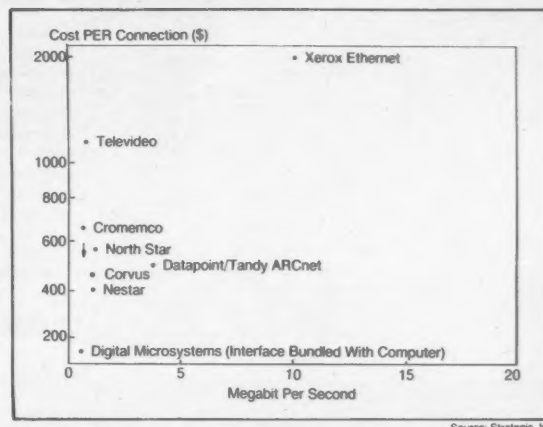
By Bruce Hoard
CW Staff

SAN JOSE, Calif. — Even though most industry attention is focused on Xerox Corp.'s Ethernet and broadband networks, the greatest amount of activity is occurring in local networks of personal computers with data rates below 3M bit/sec, according to a recent study by Strategic, Inc.

The study, entitled *Impact of Personal Computer Local Area Networks*, claims that there are 800 local-area networks installed featuring faster than 3M bit/sec transmission rates and well over 12,000 slower ones.

The study predicts sales of personal computer networks will grow to 110,000 in 1987, with 920,000 stations valued at \$4.8 billion. In July of this year, there were approximately 12,000 personal computer networks installed, with 65,000 workstations, print and file servers valued at \$264 million.

"The price of network interfaces will drop so fast that network hardware, including cables, will be a negligible part of system cost, comparable to installing telephones," the study



Cost vs. Data Rate of Personal Computer Local-Area Networks

reported. In addition, the percentage of personal computers in business and education that are connected to networks is expected to grow from 4.4% this year to 17.3% of those sold in 1987.

The average price of a personal computer network is less than \$500 and declining rapidly, the report noted, saying Ethernet and broadband networks

cost \$2,000 and more for a high-speed connection.

The leaders in low-cost networks for personal computers are Corvus Systems, Inc., which has the greatest number of installations, and Nestar Systems, Inc., which has greater revenues from selling all the components of its systems and selling large configurations.

(Continued on Page 78)

Also Works Through PBX

Unit Offers Direct Communications

KANATA, Ont. — An executive workstation said to communicate directly with other terminals and computers as well as working through a private-branch exchange (PBX) has been unveiled by Mitel Corp. here.

Competing workstations such as Northern Telecom Corp.'s Displayphone and Tymnet, Inc.'s Scanset must be connected to PBXs, a Mitel spokesman noted.

The Kontakt terminal, which will cost Canadian users \$4,299, is likely to become available in the U.S. in the near future. Mitel is now negotiating with a number of prospective distributors, but its U.S. price has not yet been decided.

Initially, the system will be able to emulate teletypewriters and Digital Equipment Corp.'s VT series of terminals, thus enabling Kontakt customers to access a number of computers. IBM 2780/3270 emulation is under development to allow communications with IBM computers, the spokesman said.

Unit Configurations

The unit reportedly consists of a 12-in. green-phosphor display screen, full ASCII keyboard, an attached floppy disk with an unformatted capacity of 500K bytes, a telephone handset and speakerphone and a special-purpose microcomputer with 128K bytes of random-access memory (RAM), expandable to 256K bytes.

Kontakt, which utilizes a Motorola, Inc. 6809 microprocessor, is user-programmable in Basic, but the relatively small memory limits its general-purpose computing capabilities, the spokesman said.

The terminal primarily supports a number of business-oriented applications, each controlled by Mitel-supplied software, the spokesman said. An agenda program, for example, enables the user to allocate his time for up to 12 months ahead. Not only are meetings listed in text form, but the program displays a graph showing what time periods and how much of each day have been committed. If the user attempts

to make an appointment within a time slot that is already committed, the system reportedly balks and tells him why.

Other features include:

- Incoming messages can be forwarded to a specified list of individuals by depressing a single key.

- Each call is timed and recorded, enabling lawyers and consultants to bill their clients for services rendered by phone.

The terminal connects to the outside world via two voice-grade lines. One is dedicated to voice communications, the other either to voice or data. This arrangement reportedly makes it possible to establish three-way conference calls largely automatically through the Kontakt station, whether or not it is tied to a PBX.

In its press release announcing Kontakt, Mitel referred to it as "the first member of the Executive Work System, ... a new family of office products." The second member will be the Phonewriter, designed for executive secretaries, the spokesman said. He expects it to be announced "before the end of this year."

The Kontakt workstation will be marketed by Mitel's newly formed Office Products Division, which encompasses Execunet Corp., a Canadian firm acquired by Mitel last June.

Mitel is located at 350 Leggett Drive, Kanata, Ont., Canada K2K1X3.

MTI stocks 'em all for faster delivery.

VIDEO TERMINALS	MTI Price	12 mo. Lease
VT 100 DECscope	\$ 1595	99
VT 18X Personal Computing Option	2395	198
VT 101 DECscope	1195	78
VT 131 DECscope	1745	101
VT 132 DECscope	1995	105
ADM 3A (dumb terminal)	595	56
ADM 5 (dumb with visual attributes)	645	59
ADM 31 (two page buffer)	1095	88
ADM 21 (full editing/visual attributes)	690	62
ADM 22 (ergonomic/edit/visual attr.)	*	72
ADM 24 (ergonomic/gp/alphics/256 filol)	*	90
ADM 32 (DEC system terminal)	*	90
ADM 42 (B-page buffer available)	*	150
TI 940 (high performance, 1-page buffer)	1650	125
Hazeltine Esprit	175	59
Hazeltine Executive 80 Model 20	1345	95
Hazeltine Executive 80 Model 30	1695	109

GRAPHICS TERMINALS

VT 125 (DEC ReGIS firmware)	3390	195
VT 100 (Tektronix 4010 emulation)	3250	195
ADM 3A (Tektronix 4010 emulation)	1795	149
ADM 5 (Tektronix 4010 emulation)	1845	152
VT 100 w/TI810 plot. (Tektronix emu)	5920	388

300 BAUD TELEPRINTERS

LA 34-AA DECwriter IV	1095	78
Diablo 620R0 spi (letter quality)	1395	108
Diablo 630R0 spi (non-expandable)	2095	147
Diablo 630R0 (letter quality)	2295	152
Diablo 630 KSR (letter quality)	2695	175
TI 743 (portable thermal printer)	1190	96
TI 745 (port./built-in coupler)	1495	98
TI 785 (port./bubble/b-i coupler)	1947	174

600 BAUD TELEPRINTERS

Epson MX-80	845	n.a.
TI 825 KSR impact	1570	104
TI 825 KSR plg.	1795	125

Ask about our "QED" discounts. Visa & MasterCard orders accepted. All lease prices include service (within 50 miles of service center). Other lease and ownership plans available. Call MTI today and save.

New York: 516/621-6200, 212/767-0677, 518/449-5959

Outside N.Y.S.: 800/645-6530

New Jersey: 201/227-5552

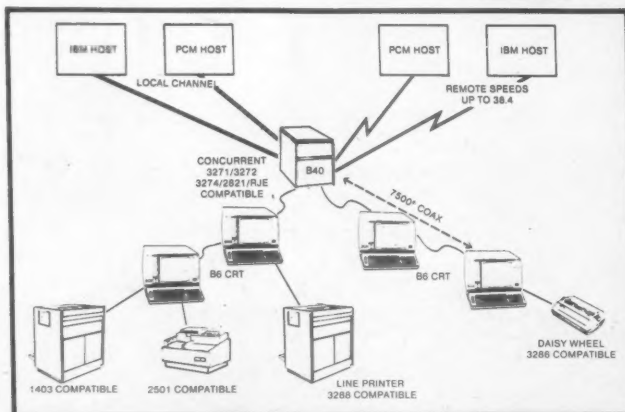
Ohio: 216/464-6688



CALL FOR LATEST PRICE REDUCTIONS

Applications Specialists & Distributors, New York, New Jersey and Ohio.

3270 USERS BRAEGEN = COMPATIBILITY PLUS



GET THESE IMPORTANT BENEFITS

- MULTIPLE HOST ATTACHMENTS.** A single B40 controller can attach to several IBM 360/370's or IBM compatible CPU's. Mix Local and Remote attachments. Reduced number of controllers.
- SWITCHABLE CRT's.** Each B6 operator can switch between available host attachments (again, mix locals and remotes). Switch between different IBM addresses on the same 360/370. Often, one Braegen B6 CRT can replace several 3270's.
- SHARE CABLES.** Braegen CRT's (and printers, too) can share the same coax. You don't need a separate expensive coax cable for each B6 CRT. Just daisy chain new B6 CRT's to existing coax.
- LONG CABLES.** CRT's (printers, too) can be up to 7500 feet from the B40. Often, this lets you use local 3270's instead of remotes. Saves 370 software size, polling and you get faster response. Sometimes, this even saves you a separate controller.
- BETTER I/O.** A wider range of speeds, and better print quality than you'll find elsewhere for 3286/3288 compatible printers. 1403 compatible printers and 2501 compatible card readers can be located up to 7500 feet outside the computer room thus eliminating all the special TP gear you have with RJE.

PLUS...Low cost and fast delivery.

Customers throughout the U.S. are receiving these benefits today. For more information please contact The BRAEGEN Corporation, 20740 Valley Green Drive, Cupertino, California 95014. (408) 255-4200



BRAEGEN

20740 Valley Green Drive
Cupertino, California 95014
(408) 725-1252 02008

Northern Telecom SL-1 Adds Optional Features

RICHARDSON, Texas — Northern Telecom, Inc. has added optional features for its SL-1 private branch exchange (PBX) business communications systems.

The optional features include a recorded overflow announcement that may be used to notify specified calling parties that all console attendants are currently busy and ask them to wait for assistance. The feature costs between \$436 and \$5,226, depending on configuration.

The call park/page feature is said to permit SL-1 console attendants or telephone set users to detach a call and have it held, or parked, within the PBX. A parked call can then be retrieved for reconnection by any SL-1 user. If the parked call is not retrieved within a specified time, it is reconnected automatically to the telephone that originally placed the call in park. The feature also costs between \$436 and \$5,226.

The vendor also announced enhancements of the SL-1 message center and automated call distribution option packages, which are priced in accordance with software in use.

Northern Telecom is located at 1001 E. Arapaho Road, Richardson, Texas 75081 and 259 Cumberland Bend, Nashville, Tenn. 37228.

Study Covers Local Net Use

(Continued from Page 77)

Both Corvus and Nestar are trying to establish their systems as de facto standards. Datapoint Corp. has the opportunity to compete with these two but is not doing so aggressively, the study notes. Other companies established in the market that intend to compete aggressively include Digital Microsystems, Inc., Televideo, Inc. and the Destek Group.

Multiple processor computers are local networks on very short buses with high data rates on the bus, but low data rates to the user. The study predicts this market is drying up.

The initial thrust in network software is to support single-user operating systems already in use and provide a few basic network applications such as electronic mail.

More and more operating systems and their attendant applications will be supported, and network software will include the ability to access outside systems while emulating various protocols. Network software will also come to include true network applications in which several computer systems cooperate to perform functions they cannot do alone, the study maintains.

"Software support is far more crucial to success than simple hardware performance," it notes. For instance, the difference between the 1M bit/sec Corvus Omninet and the .24M bit/sec Nestar Clusternet is not significant to users, who normally cannot overload either.

The primary use for local networks currently is the sharing of hard-disk storage and printers. These devices can cost more than the network hardware, so there is a considerable gain in having just a few of each that everyone can access, rather than duplicating them at each station.

An important development that will occur over the next year or two is the creation of hierarchical networks, interconnecting several of the current networks, the study reports.

The advantages of that are a much larger system both in numbers of stations and length, much higher total data rate as the subnetworks operate in parallel and low system cost per station by dividing the cost of the high-capacity spine of the network among the large number of stations attached.

The study costs \$1,500 from Strategic, Inc. at Suite 215, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

Device Telexes Via WU, Wang

GARDEN CITY, N.Y. — Office Synergistics, Inc. has introduced a device said to send telexes through Western Union Domestic and Western Union International on Wang Laboratories, Inc. word processing equipment.

The Automatic Telex Generator is used by entering messages and destinations throughout the day to be printed for verification. They appear in a format and style users understand, but will be transmitted in a communications format, a vendor spokesman said.

Once the accuracy of the message has been confirmed, the filing and processing of all messages is accomplished with a minimum of key-strokes. The file is retained for one month, each page representing one day, the vendor said.

The license fee for the generator is \$2,500. More information is available from Office Synergistics, Suite 409, 666 Old Country Road, Garden City, N.Y. 11530.

Unit Speeds Up Most Protocols

SAN JOSE, Calif. — Widcom, Inc. has introduced a communications-oriented data compression/expansion unit that is said to extend existing leased-line capacity.

Compatible with most popular synchronous and asynchronous protocols, the DCU-192 is easily added to existing facilities, a vendor spokesman said. The unit connects between the modem and data terminal RS-232C ports to provide a bit-stream compression of two to one.

This allows operations at speeds exceeding the existing communications bit rate. The unit employs three high-speed 16-bit microprocessors to perform the complex encoding/decoding algorithms necessary to ensure reliable performance at rates up to 19,200 bit/sec full duplex.

The DCU-192 is available for \$4,950 from Widcom, Inc., located at Suite 220, 1190 S. Bascom Ave., San Jose, Calif. 95128.



Classical Software For A Well-Tuned System

If your current software has hit some sour notes, take a cue from Pansophic. We have a complete range of software packages for your escalating requirements. Pansophic offers classical software... a respected portfolio that's orchestrated for maximum productivity and control... now and for years to come.

EASYTRIEVE and PRO/grammar can produce simple reports or entire applications with an ease and immediacy unmatched by other products. PANVALET and PANEXEC offer security with control to keep management objectives on key. PANAUDIT is the industry's premier audit applications tool, composed exclusively by and for professional auditors. You can count on Pansophic to deliver highly integrated software, tuned into your IBM and plug-compatible mainframe systems.

Pansophic's service is a consistent refrain, from installation to maintenance. In fact, our worldwide support team, award-winning documentation, in-depth training, and on-going enhancement program have made Pansophic the critic's choice.

Give us a call today, and learn more about Pansophic's classical software repertoire. It's a lot more than just bells and whistles.

The Classical Collection: Peak Performance Software

EASYTRIEVE

The world's most popular retrieval system, renowned for ease, power, and efficiency. EASYTRIEVE's simple commands and multiple report generation strike a responsive chord with all departments.

PRO/grammar

Powerful enhancement to the DP performance scale. This flexible productivity language with end-user reporting capabilities, has broad appeal within the data center and corporate management alike.

PANVALET

The indispensable source code management tool with on-line capabilities for TSO, ICCF, CICS, and CMS. PANVALET can conduct your different strains of software in complete harmony.

PANEXEC

The executable code library system designed for perfect harmony with PANVALET. It will provide you with the audit trail and cross reference data you need to manage high-pitched profits.

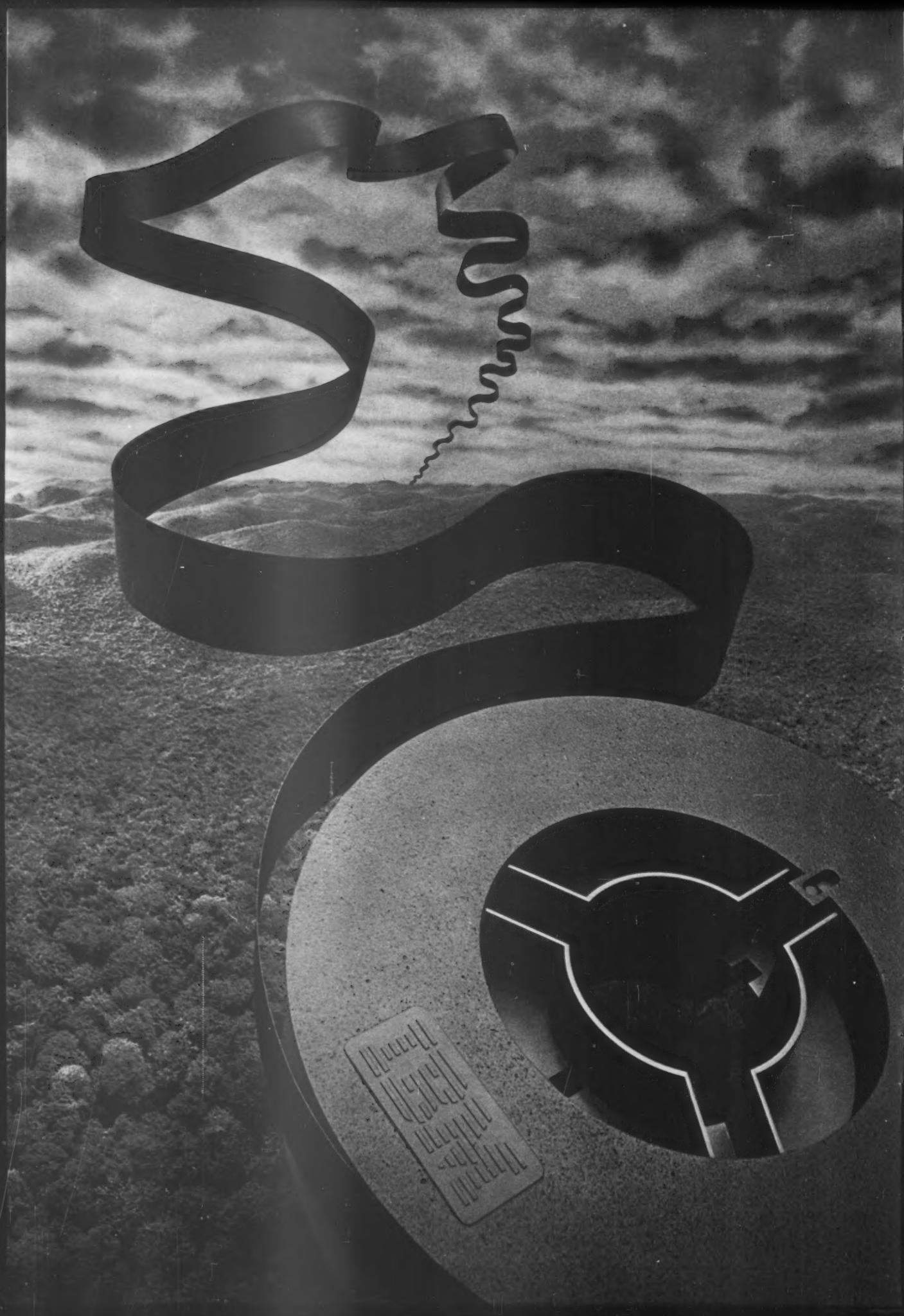
PANAUDIT

The software solution to auditing requirements, designed with the user in mind. Includes over 100 meaningful routines, instrumental to the efficiency and verification of corporate data.

EASYTRIEVE®, PANVALET®, PANEXEC®, and PANAUDIT® are registered trademarks of Pansophic Systems, Incorporated. PRO/grammar™ is a trademark of Pansophic Systems, Incorporated.

PANSOPHIC®

Pansophic Systems, Incorporated 709 Enterprise Drive, Oakbrook, Illinois 60521 800/323-7335, In Illinois 312/986-6000



IBM has tested over 864,000 miles of printer ribbon. To help you get more mileage out of every inch.

An IBM printer ribbon has a pretty rough road to travel. At virtually every turn in the production process it faces rigorous inspection.

Scanners search for flaws in fabric woven as fine as three thousandths of an inch.

Sensors are used to survey the smooth distribution of ink—ink applied by steel rollers ground to tolerances of hundreds of thousandths of an inch.

Photoelectric devices scrutinize printer ribbons containing inks precision-milled to less than 5 microns. Developed exclusively by IBM, these inks are uniquely formulated to provide consistent print quality and prolong printer life.

We go to such lengths for one very simple reason.

If you care enough about productivity to use an IBM printer, you deserve a ribbon engineered to the same high standard of performance.

We maintain that standard of quality in all IBM supplies. Supplies you can conveniently order by contacting your IBM Systems Supplies Representative. Or by calling IBM Direct, toll free, at 1 800 631-5582.*

From printer ribbons to printer stands, you can depend on IBM. Because confidence is the most important thing we supply.

To add your name to our mailing list for our free IBM Supplies and Furnishings catalog, call **IBM Direct, toll free, at 1 800 631-5582*** or mail this coupon today. You'll also learn more about money-saving opportunities, including quantity discounts and mix-and-match pricing.

I have ☐ have not ☐ received an IBM catalog in the past year.

NAME _____ TITLE _____
COMPANY _____ TEL. _____
STREET ADDRESS _____
CITY _____ P.O. BOX _____
STATE _____ ZIP _____

*(In Hawaii or Alaska 1 800 526-2484)

Mail to: IBM Corporation, Systems Supplies Division, Attn: IBM Direct, 1 Culver Road, Dayton, N.J. 08810.

CW 8



IBM
®

Decatenator Runs On Polled Multidrop Nets

ATLANTA — Computer Peripheral Systems, Inc. has introduced a modem-sharing device for Burroughs Corp.; Honeywell, Inc.; IBM; NCR Corp., and other polled multidrop networks where more than one terminal would normally be daisy chained or concatenated to another.

The Decatenator is connected after the modem and allows each terminal to operate independently of the others. It can also be used with terminals that do not contain an additional daisy chain or concatenation port.

The device contains one input modem port and four output terminal ports. Each port will support one terminal or a daisy-chained string of terminals. It will support data com-

munications line speeds up to 19.2K bit/sec and requires no external power, a vendor spokesman said.

The sharing device is available for \$195 from Computer Peripheral Systems, 3870 N. Peachtree Road, Atlanta, Ga. 30341.

Workstation Controller Talks Back

PITTSBURGH — Algor Interactive Systems, Inc. has unveiled a multidevice talking workstation controller.

The device, which incorporates a 4-in. speaker and voice chips for program-controlled voice feedback, allows three independent devices, such as terminals, graphics display units, digitizer tablets or printers to

Carterphone 9830 Terminal Compatible With Burroughs

DALLAS — Carterphone Communications Corp. has introduced a terminal designed for compatibility with the Burroughs Corp. TD830 and MT983. Installation and setup are said to be identical to that of these

two Burroughs terminals.

The Carterphone 9830 offers a standard display memory of 4,000 char., an optional 4,000-char. extended memory, programmable function keys, integral numeric pad, concatenation with autobypass, addressable serial printer port, help message, line monitor mode and a confidence test, the vendor said.

The concatenation with autobypass feature is said to allow any powered-down station in a concatenation string to be bypassed automatically. This is said to eliminate need for cable reconnection. The terminal supports any RS-232 printer, a vendor spokesman said.

The terminal is available for \$1,795. More information is available from Carterphone Communications, Suite 1400, 1111 W. Mockingbird Lane, Dallas, Texas 75247.

Modem Works Limited Distance

LINCOLN, R.I. — International Data Sciences, Inc. has introduced a limited-distance modem designed for asynchronous operation over two- and four-wire nonloaded metallic conductors at speeds up to 19.2K bit/sec.

The Model 6200 features internal strap selections for receiver impedance, receiver equalizer and two- or four-wire operation. It employs a baseband modulation scheme that varies the voltages of the transmit signal on a balanced line requiring dc continuity. Its data terminal equipment interface meets RS-232 and V.24 specifications.

The company has also introduced its 8501 Data Patching and Monitoring Module that is said to allow the user to switch, patch and monitor all 25 leads of the EIA interface and display three interface signals.

The modem is available for \$250; the 8501 is available for \$195. More information on both products is available from International Data Sciences, 7 Wellington Road, Lincoln, R.I. 02865.

CONVERTING TO OS? EASY MADE EASIER.

Now you can run OS without converting DOS programs or JCL. With new UCC-2 + 20.

It used to be that conversion from DOS to OS took three steps: a lot of careful planning, a laborious translation of all JCL, plus a massive (and expensive) conversion of thousands of programs.

The UCC-2 DOS under OS System changed all that — eliminating the need to convert any DOS programs to OS. That makes converting to OS easy.

Now, the UCC-20 JCL Generator makes it easier. And it won't generate JCL that doesn't fit your own predefined standards.

So, with UCC-2 + 20, once you've completed the planning and preparation phase — you're running OS. It's that simple.

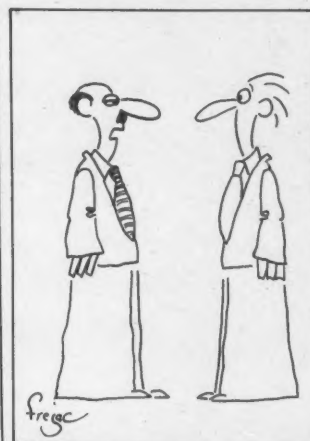
With UCC-2, getting to OS was easy. Now, with UCC-2 + 20, it's even easier.

For more information, call us toll-free at 1-800-527-5012 (in Texas, 214-353-7312).

UCC

... has done it again!

UNIVERSITY COMPUTING COMPANY • DALLAS • LONDON • TORONTO • ZURICH



'In the Future, Hargreaves, We Would Prefer It If You Would Use More Rigorous Means Than Tarot Cards to Debug Programs.'

Packages Integrate Micros Into Corporate Net

SAN FRANCISCO — Integrating microcomputers into the corporate data network is the goal of two new products introduced here by the Datalex Co.

The software packages that achieve

Virtual System Helps Terminals Emulate 3270s

MOUNTAIN VIEW, Calif. — Icot Corp. has introduced a virtual terminal system said to allow up to six different types of Ascii terminals or personal computers to emulate more sophisticated IBM 3270 series terminals.

The Icot 351 can allow six users to be on-line to two applications simultaneously, the vendor said. Each user reportedly can switch back and forth between applications without logging off either session. Communications are provided using IBM Binary Synchronous Communications and IBM 3271 Synchronous Data Link Control protocols at speeds up to 19.2K bit/sec.

The system is available for \$5,800 from Icot, 830 Maude Ave., Mountain View, Calif. 94043.

Batch Program Supports IBM

NEW YORK — Computer Dynamics, Inc. has announced that its Batch Communications Program (BCP) now provides host support for the IBM 5280, Series/1, 4321, System/3, System/32, System/34, System/38 and 3741 distributed data processing systems.

It also supports communications with the System/23 Datamaster, the IBM Personal Computer, the 5520, the 5230 and Displaywriter systems, the vendor said. It supports 400 to 500 terminals and is a multitasking communications system that has the capability to transmit over 100 communications lines simultaneously.

The price of the BCP varies from \$8,000 for the single-line version to \$30,000 for the multitasking version, which will support up to 100 communications lines or 1,000 terminals. More information is available from Computer Dynamics, Suite 407, 390 Fifth Ave., New York, N.Y. 10018.

Modem Out for Lines Or Switched Networks

SUNNYVALE, Calif. — Racal-Vadic, Inc. has introduced a 4,800 bit/sec modem said to operate without any conditioning level requirements over two-wire switched networks or two four-wire leased lines.

The VA4840 can operate in a point-to-point network or in a multipoint environment. It features automatic adaptive equalization, allowing the modem's receiver to change its filtering and adapt to different telephone line conditions involving amplitude roll-off, phase delay, frequency offset and carrier-phase jitter.

It costs \$1,600 from 222 Caspian Drive, Sunnyvale, Calif. 94086.

this integration are Entrypoint, which turns most desktops into screen-oriented intelligent data entry systems for stand-alone or distributed DP applications, and Passport, which can be used with Entrypoint to provide a communications link between mini and mainframe computer hosts, according to the vendor.

Entrypoint reportedly enables high-level and user-friendly screen formatting and includes a data validation interface, which checks each keystroke entered. For example, if a number is entered into a letter field, the user is signaled immediately by an error message.

Passport is an adaptable remote communications program for file or

program transfer between microcomputers and mini or mainframe systems. Completely menu driven to match any micro to the host, this product allows the microcomputer to load and store files and programs from the mainframe or to output them to locally supported devices, the vendor said.

Features

This product reportedly features bidirectional Ascii or binary file transfer, transfer of groups of files or volumes, a simple user interface, program initiation from either micro or host, data integrity, blank compression, bidirectional control of communications and screen options and optional reformatting of

transactions from the micro.

These Datalex programs use the portable UCSD P-System that runs on microcomputers built around most popular microprocessors, according to the vendor. These include Intel Corp.'s 8080, 8085, 8086 and 8088 machines; Zilog, Inc.'s Z80 and Z800; Motorola Corp.'s 68000; MOS Technology, Inc.'s 6502; Texas Instruments, Inc.'s TI-9900; and Digital Equipment Corp.'s LSI-II. The programs communicate with minis and mainframes from IBM, Hewlett-Packard Co., DEC and others.

Entrypoint costs \$1,000 and Passport sells for \$400. Datalex can be contacted for further details at Suite 406, 650 Fifth St., San Francisco, Calif. 94107.

FREE TICKETS

INFORMATION/WORD PROCESSING

EXHIBITS

IWP FALL SYMPOSIUM & EXPOSITION

Phoenix Civic Plaza, Phoenix, Arizona November 9-11, 1982

Only ten minutes from Phoenix Sky Harbor International Airport

**BOARD A PLANE,
TAKE A TRAIN,
HAIL A CAB,
CATCH A BUS,
DRIVE YOURSELF,
WALK, JOG OR RUN—
BUT COME SEE US!**

See a multi-million dollar display of office automation equipment—word processing systems—computers—video display terminals—communications systems—facsimile equipment—copiers—dictation systems—plus scores of other products and services.

Watch them operate—increase your knowledge—get hands-on experience—learn how you and your company can benefit.

If you are a President, Vice President, Director, Manager, Supervisor, or Staff Person in any of the following industries, you'll profit from visiting the IWP exhibits:

- ☐ Agriculture ☐ Communications ☐ Construction
- ☐ Finance ☐ Government ☐ Manufacturing
- ☐ Mining ☐ Retail ☐ Services
- ☐ Transportation ☐ Utilities ☐ Wholesale

Also get information on sessions and fees for full conference participation. Call number at left for free brochure.

**Call now
TOLL-FREE**

for your free
exhibits-only tickets

(800) 241-3366.

In Georgia, (404) 396-5730.

Tickets will be sent to you
first-class mail.

Provides Error-Free Channel

Modem Out for High-Speed Devices

CANOGA PARK, Calif. — Canoga Data Systems, Inc. has introduced a modem that is said to be plug-compatible with high-speed, 1.544M bit/sec data devices and provides an interference-free and error-free data channel over distances up to two kilometers.

The Model CSY306T1 modem is a fiber-optic product that replaces conventional wire cable in data link applications such as satellite down-link circuits, computer-aided design and manufacturing installations and CPU-to-CPU communications.

Available in stand-alone or rack-mount packaging, the modem is suited for use in existing data communications systems or in new

installations, a vendor spokesman said.

The unit is available for \$1,800 from

Canoga Data Systems, 21218 Vanowen St., Canoga Park, Calif. 91303.

Alarm Control Unit Out

WORCESTER, Mass. — A fiber-optic alarm control unit for enhancing the reliability and security of video, audio and data communications is available from Artel Communications Corp.

The ACU-2000 plug-in module alarms up to seven communications channels with audible and visual alarms and also provides an automatically switched redundant power supply.

It can be used to detect and foil intrusion in secure military communications and monitor critical channel operation in high-reliability local network and trunking applications.

The product plugs directly into the vendor's SL-2000 Fiber Optic Transmission System 19-in. card frame and costs \$600, according to Artel, which can be reached through P.O. Box 100, W. Side Station, Worcester, Mass. 01602.

WP Terminal
Can Emulate
Popular Units

ST. LOUIS — Micro-Term, Inc. has introduced a full-page word processing terminal displaying 66 lines by 80 char. of text on a single screen. The terminal may also be reprogrammed by the user to emulate other popular terminals by assigning different control codes and escape sequences for normal functions.

The Ergo 4000 is compatible with the Digital Equipment Corp. VT100 terminal in both Ansi and VT52 modes, the vendor reported. It also features bidirection pass-through printer port, 15 user-programmable function keys, savable set-up mode and alternate character generation. Also included are diagonal cursor movement, margin bell and tabs, screen saver and transparency mode.

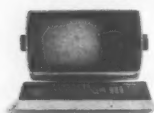
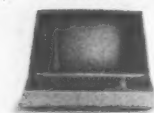
The terminal is available for \$1,695 from Micro-Term, Inc., 1314 Hanley Industrial Court, St. Louis, Mo. 63144.

AT&T Text Out
On Bridging Net

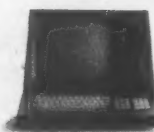
NEW YORK — AT&T has released a technical reference describing the network Data Bridging interface, which the Bell System plans to support beginning in 1983, pending business decisions and regulatory approval.

The capability is said to allow for the multipoint bridged connection of terminals through an interface that will follow the specifications of the evolving CCITT recommendation for Group 4 facsimile, according to a vendor spokesman.

The technical reference describing the network Data Bridging interface (PUB 54050), entitled "Data Bridging Network Compatibility Specifications," costs \$11 from AT&T at Publishers' Data Center, Inc., which can be reached through P.O. Box C738, Pratt St. Station, Brooklyn, N.Y. 11205.

WORD
PROCESSING
SYSTEMDISTRIBUTED
DATA
PROCESSINGONLINE
INQUIRY
SYSTEMDATA
ENTRY
SYSTEM

\$25,000



ditto

\$5,417

Our new CDX-268 Series distributed processing system combines those applications that once called for separate terminals into one cost efficient system. So when you need to perform extra functions, you don't have to buy extra terminals.

The CDX-268 Series from Codex. One system for multiple applications. One system that lets you put together a totally integrated network for optimum efficiency and lower cost. For more information call 1-800-821-7700, ext. 893.

codex

NOTOPOLIA INC.
Information Systems Group

See us at TCA, San Diego, September 21-24.

Codex Corporation, 20 Cabot Blvd., Mansfield, MA 01948 / Tel: (617) 344-2000 / Telex 92-2443 / Codex Intelligent Systems Operation, Tempe, AZ Tel: (602) 994-6580 / Codex Europe S.A., Brussels, Belgium Tel: (02) 762.23.51 / Codex (U.K.) Ltd., Croydon, England Tel: 01-680-8107 / Codex Deutschland, Darmstadt-Griesheim, W. Germany Tel: (6191)-3051 / Codex Far East, Tokyo, Japan Tel: (03) 373-0412 / ESE Ltd., Toronto, Canada Tel: (416) 749-2271 / Offices and distributors in major cities throughout the world. Member of IDCMA.

All prices estimated on cost per user. CDX-268 four-user System includes 128K memory, 2 MB storage, 120 cps printer, communications interface, all software. Price subject to change without notice.

UNIX is a trademark of Bell Laboratories.



Year-Old DP Start-Up Offers Field 32-Bit Mini With Up to Three Buses For Science, Engineering

LITTLETON, Mass. — The Massachusetts Computer Corp. (Masscomp), a year-old start-up based here, announced its first product last week: a high-performance 32-bit minicomputer for scientific and engineering applications that boasts a series of dedicated processors and up to three system buses.

The MC-500 features a main 32-bit processor (dual Motorola, Inc. 16-bit 68000 chips), a 4K-byte cache memory, up to 6M bytes of error-checking and correcting memory and a virtual address space up to 16M bytes. The system can also include two independent processors: a user-programmable CPU for data acquisition and control that can input or output analog and digital data at rates up to 2M byte/sec and one that is geared for graphics.

In benchmarks performed by the firm, the system reportedly operated at a performance level equal to Digital Equipment Corp.'s VAX-11/750 computer. However, the MC-500 is said to cost 25% to 30% of the DEC machine's price.

The performance-oriented system was basically designed for three applications: graphics, high-speed computations and data acquisition. Typical applications might include medical or geophysical research. Several systems are already scheduled to be installed, and the firm expects to have 100 to 150 installed over the next year.

The system's three processors are tied to physical memory (from 512K to 6M bytes) via the firm's MC-500 bus. This bus can reportedly support 4-byte transfers using a block-mode protocol. The memory system bandwidth is 8M byte/sec. The MC-500 bus can also be used to access an optional floating-point processor, as well as an array processor, a spokesman said.

Peripherals, such as tape and disk drives and CRTs, are ac-

cessed via an Intel Corp. Multibus. The Multibus supports multiple disk and multiple Ascii terminals, network hardware and software-based printers and plotters. It can also support up to four independent display processors, as well as the data acquisition and control processor.

The third bus, called STD+, was developed by Masscomp and was designed to support laboratory instrumentation. It provides a data rate up to 2M byte/sec and sports a parallel digital I/O interface, a serial line interface and a general-purpose interface bus.

Enhanced Unix

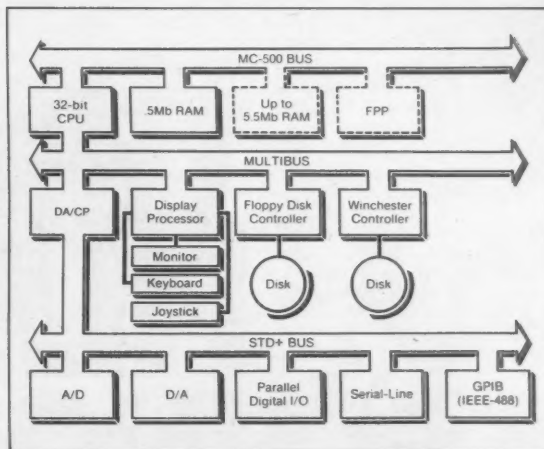
Standard software for the system includes Bell Laboratories' Unix with real-time enhancements, a menu-driven user interface and window management system and acquisition and display software libraries. While the Unix operating system is licensed from Bell Labs, Masscomp enhanced it with such features as virtual memory support, memory-locked processes, contiguous files, priority-scheduled processes and priority interrupt-driven multitasking.

The MC-500 also includes a remote diagnostics capability and is fully supported by Masscomp, the spokesman noted.

Ties SI Controllers to VAX-11/750

SI Introduces Single-Board Interface

MILPITAS, Calif. — System Industries, Inc. (SI) has introduced a single-board interface that reportedly permits SI's Model 9400 and 9800 disk systems controllers to be connected to the Digital Equipment Corp. VAX-11/750. The interface can boost a VAX-11/750's data throughput and permit multiple processors to share the same data base, SI claimed.



MC-500 System Architecture



Masscomp's 32-Bit Mini

The system also supports the bi-synchronous communications protocol (offered under Unix), and will eventually support X.25 and Ethernet, he said.

The cost of a typical system, targeted for data acquisition and control, is about \$36,000. This includes 27M bytes of Winchester storage, a 1M-byte floppy disk drive, 512K bytes of memory, a 4K-byte cache, three serial lines, real-time Unix soft-

ware, a graphics and data acquisition and control processors, a 15-in. CRT display, joystick, remote diagnostics and menu system user interface and window management system.

A graphics-oriented system costs about \$31,800, and other systems start at \$28,000. OEM discounts are available, the spokesman said from the firm at 543 Great Road, Littleton, Mass. 01460.

to a user's existing software. It also makes disk subsystems software-transparent to Bell Laboratories' Unix, VMS and other widely used VAX-11/750 operating systems, the spokesman said.

With a 160M-byte Winchester disk system and controller, the interface costs \$15,200 from SI, located at 1855 Barber Lane, Milpitas, Calif. 95035.

THE TELEPHONE COMPANY CALLED US.



Equipment shown is: Hewlett Packard 2624B

When the telephone company needed to rent computer terminals and data communications equipment, they called Data Rentals/Sales, Inc.

Founded in 1966, Data Rentals/Sales, Inc. is one of the oldest national firms in the data communications business. We specialize in the rental and sale of computer terminals for data entry and retrieval, data communications and computer graphics to firms of all sizes and types. Our offices across the country can help you—whether you're local or long distance.

Data Rentals/Sales, Inc. represents nearly every major data communications equipment supplier including Texas Instruments, General Electric, Hewlett Packard, Digital Equipment, Teletype Corporation, Lear Siegler, IBM, and Racal-Vadic.

Whatever your company's data communication needs are, we've got your number (or we can reach out and help). Just give us a call. The phone company did. And they're a pretty big operator.

DATA RENTALS/SALES, INC.

Corporate Headquarters: 8611 Hayden Place (P.O. Box 3257), Culver City, CA 90230

Los Angeles (213) 559-3822 Outside Florida (800) 237-0863 Charlotte (704) 523-6695
San Francisco (415) 697-4911 State of New York (800) 345-8026 Philadelphia (215) 532-7440
Outside California (800) 421-4505 State of New Jersey (800) 345-8026 Tampa (813) 934-0829

**THIN
FILM
TECHNOLOGY.**

**WHILE
THEY
TALKED,
WE
DELIVERED.**

MEMOREX

A Burroughs Company

U.S. Equipment Sales & Service
San Tomas at Central Expressway
Santa Clara, CA 95052 (408) 987-1256



'Pixelcaster' Available

Intelligent Visual Preprocessor Unveiled

ANAHEIM, Calif. — Vision Peripherals has introduced an intelligent visual preprocessor that is said to allow computers to develop and implement image-processing algorithms.

The Pixelcaster, which is available

in a two-, three- or four-board set, reportedly allows the computer to take advantage of all information in a video signal, including color. Applications include video-text recognition, noncontrast measurement, robot vision, remote monitoring and intrusion detection, a spokesman said.

The device operates via an RS-232C interface and features a Zilog, Inc. Z80A CPU, a high-speed memory for storage of up to 1,024 image samples and coordinates of sample locations. The Pixelcaster responds to commands by performing a function, such as sample, load memory, load offset or jump to a routine, the vendor explained. The command set was designed to be compatible with

mainframe, mini or personal computers that use a standard RS-232C interface.

Programs for the Pixelcaster reportedly can be written in any high-level language, including Basic. A 1K-byte random-access memory (RAM) is available on board for data and code, along with 2K or 4K of read-only memory (ROM). An additional 48K of RAM and up to 16K bytes of ROM can be added by plugging in an optional memory-expansion board.

The Pixelcaster is priced from \$650 to \$790, depending on the user's configuration.

Vision Peripherals is located at Suite 301, 2612 W. Lincoln Ave., Anaheim, Calif. 92801.

HP Users Get 240M-Byte Drive



Qualex's Model 3321

WESTLAKE VILLAGE, Calif. — A 240M-byte removable hard disk drive for Hewlett-Packard Co. computer systems has been introduced by Qualex Technology, Inc.

The Model 3321 drive reportedly incorporates the same controller as Qualex's Group 3000 60M-byte Winchester drive introduced earlier this year. It has a mean time between failures rated between 4,000 to 6,600 hours with four to six disk pack swaps/day and can be fitted with four proprietary cache storage devices and optional dual I/O ports.

The drive can be linked with up to 15 similar units for high-storage requirements, a spokesman reported.

The Model 3321 drive costs \$26,500. Additional slave units are priced at \$21,450 each from the firm at Suite 110, 31220 LaBaya Drive, Westlake Village, Calif. 91362.

Plotter Features Resident Program

LANSDALE, Pa. — A plotter featuring low-inertia grit-roller paper transport technology has been introduced by Numonics Corp.

The Model 5412 features a resident program for plotting smooth nonpolygonal arcs. Firmware for vectors, arcs, line types, markers, 96 Ascii characters and character and marker scaling is standard.

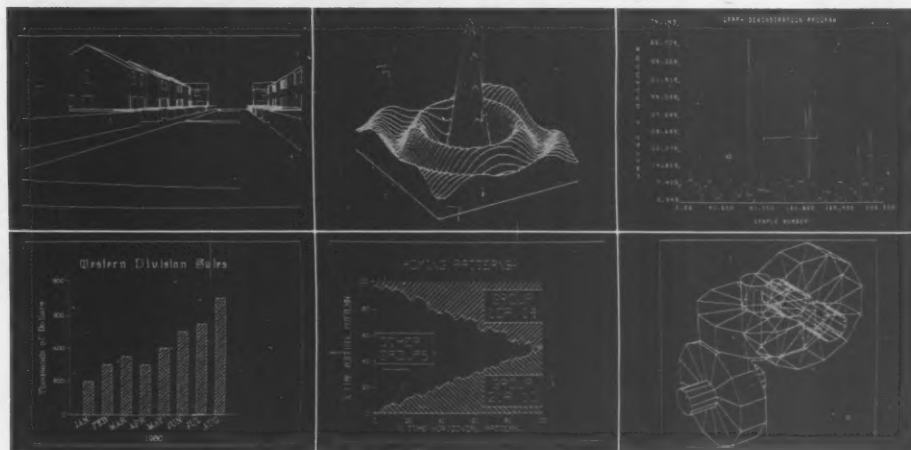
The plotter costs \$1,295 from the firm at 418 Pierce St., Lansdale, Pa. 19446.

BOSTON AREA WAREHOUSE & DISTRIBUTION SERVICES AVAILABLE

- Air Ride Equipment
- Displays & Exhibits
- Truck Load & LTL Consolidation
- Plant & Office Relocations
- Air Cargo Charters

WEEKLY AIR CARGO SERVICE
NON-STOP LA-BOSTON-LA
MONDAY DELIVERY BOTH TERMINALS
LOW RATES

(617) 935-9020
AMERICAN TRANSPORT CORP.
"THE PROBLEM SOLVERS"



Give your TeleVideo® terminal a new image.

If you have a TeleVideo® terminal, you're just minutes away from a high quality, versatile graphics system. At a very low price.

Our SG950 graphics enhancement gives you full Tektronix® 4010 emulation on TeleVideo®950 terminals. 4010 emulation also is available for TeleVideo®925 terminals with our SG925 graphics packages.

But chances are you'll prefer our built-in native mode graphics capability, a powerful tool that makes it easy to program graphics applications. Even if you're not a programmer.

You won't have to give up your regular TeleVideo® capabilities. And our separate graphics memory means you can switch from graphics to standard mode without losing data.

Our features have exceptional drawing power.

There are a lot of other reasons why our retro-fitted graphics are the best choice: Higher X-axis resolution than the competition. Larger addressable plot area, too—65K x 65K dots. Our switch selectable power-up modes allow you to choose the TeleVideo® mode, Tektronix® or native mode. Enhanced speed feature. Cross hair cursor and light pen options. And our easy-to-use software is compatible with many many operating systems.

High quality graphics on your LA120.

If you have an LA120 printer, our SG120R board can give it fast raster graphics capabilities. Our printer port option for TeleVideo® terminals is totally transparent to the system, so you can print alpha-numerics and graphics interchangeably. We can also interface with many other popular printers. Including DEC™ LA34 and C.10h 8510.

If you want to give your TeleVideo® terminal a new image, call Selanar. We're the experts in high quality, low-cost graphics.

SELANAR
GRAPHICS

We're giving terminals a new image.

Selanar Corporation, 437-A Aldo Avenue
Santa Clara, CA 95050 (408) 727-2811

TeleVideo® is a registered trademark of TeleVideo, Inc. Tektronix® is a registered trademark of Tektronix, Inc. DEC™ and LA are registered trademarks of Digital Equipment Corporation. Selanar Graphics and SG are trademarks of Selanar Corporation.



CAD/CAM System Offers Desktop Display Unit

SANTA CLARA, Calif. — A computer-aided design and manufacturing (CAD/CAM) system featuring a desktop display unit and a desk-like enclosure has been introduced by Calma Co.

The Calma 170 plugs into a standard 110V outlet and features a 19-in. graphics display unit. The display is available in black-and-white or color and reportedly fea-

tures high-resolution raster technology.

The system can operate as either a self-contained, stand-alone unit or as part of a distributed network of automated systems. It costs \$99,950 and was designed to be an integral part of the Calmanet high-speed local-area network. Calma is at 5155 Old Ironsides, Santa Clara, Calif. 95050.

Tape Controller Links Drives To IEEE-488 Standard Bus

BELTSVILLE, Md. — Ideas, Inc. has announced the Series 4600, a magnetic tape system controller that links ½-in. tape drives to an IEEE-488 standard bus.

The Series 4600 is an enhanced version of the controller announced by the firm in 1976. Features include a tape speed from 25 to 90 in./sec and a transfer rate up to 144K bytes/sec.

The unit comes with 19K bytes of double-buffered memory, which can be expanded to 24K bytes, a spokesman for the vendor said.

The Series 4600 costs \$4,995, the vendor said from 10759 Tucker St., Beltsville, Md. 20705.

System Handles Graphics

LAFAYETTE, La. — An Intel Corp. 8086/87 16-bit processor-based color graphics system has been announced by Phoenix Computer Graphics, Inc.

The Phoenix 1024 High Resolution Color Graphics System is said to feature a viewable matrix of 1,024 pixels by 1,024 pixels, with either 4- or 8-bit planes of pixel-addressable memory.

The unit's writing speed is 800 nsec/pixel with zoom magnification of 1:1 to 16:1, the vendor claimed. The system uses Digital Research, Inc.'s CP/M-86 operating system. Standard communications mode is RS-232C with protocol being asynchronous 8-bit plus start and stop bit. The transmission speeds range from 110 bit/sec to 9,600 bit/sec. The device also supports IBM System Network Architecture/3270 protocols.

The system reportedly provides 16M bytes of addressable memory space, 64K bytes of random-access memory (RAM) technology with 128K bytes of RAM or system memory. The 1024-01 desktop model starts at \$20,000, and the 1024-10 console model ranges from \$28,000 to \$30,000 from the firm at 1309 Pinhook Road, Lafayette, La. 70503.

The IBM Modem: It shows where to right what's wrong.

Let the IBM Modem warn you *before* you have a problem with a temperamental phone line. Working with software available for many IBM host systems, the IBM Modem provides early alert and line-quality analysis.

There's more. With this software, you get a continuous analysis of your entire communications network — without disrupting your data processing. It shows you where to right what's wrong.

The IBM Modem family includes the 3863, 3864 and 3865, with a line-speed range of 2400-9600 bps. They work on standard unconditioned lines, including switched lines. In point-to-point and multi-point configurations. With fast turnaround at all speeds.

In many IBM host environments, it's all part of a total system solution. With IBM reliability and service to support your critical network requirements.

Try a set of IBM modems for up to four weeks.

To get your copy of a free brochure, or to arrange to have an IBM representative contact you, please telephone us toll free at 800-631-5582 Ext. 90 in Hawaii or Alaska, 800-526-2484 Ext. 90.

Or call your local IBM representative.

Or return the coupon.

IBM



IBM Corporation
Direct Response Marketing,
Dept. 7AG Parsons Pond Drive
Franklin Lakes, New Jersey 07417

- ☐ Please have a representative call me.
☐ Please start me on the four-week trial.
☐ Please send me more information on IBM Modems.

Name _____ Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____

CW-9-13



'Yes — It Only Prints Historical Data.'

Series/1 Word Processing

SUBSCRIPT

Add SUBSCRIPT word processing for 1/10th the cost of stand-alone word-processors

- With your present terminal configuration (uses only 20K)
- Runs under EDX Release 3
- No special operating system requirements
- Handles letters, memos, reports, mail merge and documentation

Academic Software
Research Associates
7010 Hartcrest Drive
Rancho Palos Verdes, CA 90274
(213) 541-7204

Mini Bits

Uninterruptible Power Supply Designed for Minis, Micros

ANAHEIM, Calif. — General Power Systems, Inc. has announced a line of uninterruptible power supplies (UPS).

Called the GPS-906 and GPS-2006, the units are rated at 90 and 200W, respectively. Functioning similarly to UPS systems for larger processors, the units reportedly eliminate problems caused by common and transverse-mode noise, transient conditions, frequency shifts, over/under voltage and complete loss of power.

The units can provide uninterruptible power for 10 minutes. The GPS-906 costs \$395, the GPS-2006, \$695. The vendor is located at 1400 N. Baxter St., Anaheim, Calif. 92806.

Automatic System Protects Units Against Primary AC Loss

SAN DIEGO — The Powermark Division of Topaz, Inc. has announced a 300-VA square-wave Automatic Power System (APS) designed to protect small systems against losses of primary ac power.

The APS comprises an internal 20-ampere-hour battery, battery charger, static inverter and power transfer switch. When line voltage falls below a predetermined level, the transfer switch transfers the load from the ac line to the APS inverter; transfer time is said to be 4 msec. The inverter converts the battery power from dc to ac.

Backup times range from 12 to 180 min, depending on the APS model and load rating. Prices start at \$690 from Topaz, 3855 Ruffin Road, San Diego, Calif. 92123.

Turnkey Patient Accounting Out for Medical Practices

LANSDALE, Pa. — Paulmarc Systems, Inc. has announced a turnkey patient accounting system for ophthalmologic and other medical practices.

Based on a Digital Equipment Corp. PDP-11/23 16-bit processor, a basic system includes 128K-bytes of main memory and a 34M-byte Winchester disk drive. Also included is a 17M-byte tape cartridge unit, a four-port multiplexer, two display terminals and one printer.

A basic system costs about \$40,000, the vendor said from Green and Lincoln, Lansdale, Pa. 19446.

TI-Based Turnkey System Designed for Manufacturers

EL SEGUNDO, Calif. — A Texas Instruments, Inc. TI 990-based turnkey system made for manufacturers and distributors is available from Mini Data Systems, Inc.

A basic Minutopic System includes 256K-bytes of main memory, a 32M-byte disk drive, one video display terminal, a 75 char./sec printer and a choice of the Distribution Management System, Accounting Management System or Materials Management System application modules.

The basic system costs \$29,900 from Suite 359, 2041 Rosecrans Ave., El Segundo, Calif. 90245.

Dual-Sided Flexible Certifier Handles Quality Assurance

PHOENIX — A dual-sided 5¼-in. flexible disk certifier for quality assurance, incoming inspection and engineering evaluation applications has been announced by Three Phoenix Co.

The 3PX151 features microprocessor control, operator-selectable testing, 48 track/in. or full-surface testing and 96-track/in., 5¼-in. drive.

The unit's base price is \$19,500 from the firm at 21639 N. 14th Ave., Phoenix, Ariz. 85027.

Specifics of Broad Overview While Auditing Own System Offers Productivity Answers

By Robert E. Berkman
Special to CW†

OK. You've installed a minicomputer system in your company and it has resulted in a huge improvement in productivity over your manual system. The system is running and you're happy.

But is the system operating to its maximum efficiency? Can you squeeze just a little more work out of your new automated workhorse?

Small business systems users, who install computers without the support of their own technical staff or the use of consultants, often end up laboring under the burden of ineffective systems. To make matters even more difficult, in some cases, the small user does not know the system is ineffective.

Compared to a manual system, the speed and data availability of the computer may be a huge improvement.

However, compared to other systems and approaches, the computer may be functioning at a level that leaves much to be desired.

Broad Overview

In some cases, there is definitely something wrong with the computer system. Not only is it not working at an optimum level, but it is actually creating new problems. In this case, getting the system to function often involves a series of hit-and-miss fixes.

At best, there is temporary relief; usually, there is constant turmoil.

On a regular basis, the small systems user has to step back and take a broad overview of the entire system.

This review should not only include the programs, but also include procedures, personnel and the use of information generated by the system. It must include all factors that contribute to a computer installation's failure or success.

Some factors are obvious. Others are not so obvious. For those who want to do their own system audits to determine if the system is working to its maximum efficiency, the following guidelines can be used as a road map.

If you are using a consultant, these steps might provide a basis of what questions to

ask and what points to examine and review:

- **Data Integrity.** Are there questions about the accuracy of the data and information being provided? Specifically, in what reports and in which files is the accuracy in question, what procedures can be established to validate the data and what procedures can be established to improve accuracy?

- **System Controls.** The manual controls that are set up to authenticate the input system must be reviewed. If none exist, they must be established immediately.

- **Are control procedures used to spot error conditions designed to react on an immediate basis? Are these controls designed to focus on small data segments that will allow the user to review and pinpoint problems easily?**

- **Data Validation.** The system should be geared to validate any possible entry field at the earliest point in time. On-line systems generally should check to ensure that data is validated on-line rather than going through edit runs and batch updates.

- **The machine's data should be matched against master files for standard type data and for reasonableness in other numeric fields.**

- **Management Information.** The information used to make management decisions should be valid for making those decisions.

- **Often, the information being used only provides a piece of the total picture or a distortion of the characteristics on which the decision is to be made.**

- **Operational Effectiveness.** Procedures should be established from the user's perspective. Users should not have to go through awkward procedures to be able to operate the system.

- **Response times should be checked to ensure they are adequate for a productive environment. The audit should review work volumes, current computer demands and the system's saturation point.**

- **Missing Requirements.** The audit should investigate the possibility that vital information requirements are not being met.

- **It should also review what applications are candidates for automation and what impact they have on other applications and system performance.**

- **Operating Environment.** Is the operating/system environment safe from catastrophic data loss?

- **Backup procedures should be readily available to protect against power spikes and losses, as well as a total system breakdown. The audit should pinpoint what circumstances could shut down the operation and how fast you can recover from them.**

- **Personnel Dependency.** How dependent are you on key individuals? Is the system self-supporting, or could removing a key person cause substantial risk to the company's ability to function?

- **Documentation.** Is the documentation adequate? Written procedures and instructions should be within easy reach of the user. Also, any new programmer should be able to walk in and maintain or do addition and modifications easily to the system.

Berkman is a consultant and president of Robert E. Berkman Associates in Morris Plains, N.J.

Wang Processors Receive Add-In Memories

NEWTON, Mass. — EMC Corp. has announced a line of add-in memories for Wang Laboratories, Inc. VS series processors.

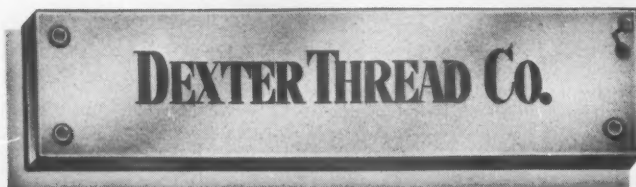
Available in 256K-, 512K- and 1M-byte increments, standard features include an error light that indicates when the memory has detected a fault and an off-line switch that allows a user to disconnect the memory electrically without actually removing it from the chassis, the vendor said.

The VSM-1MB 1M-byte board uses a 64K-byte memory chip with very large-scale integration.

The 1M-byte version costs \$9,500, the vendor said from 385 Elliot St., Newton, Mass. 02164.

INTENTWORKS

THE UPV MOBILE CO



Upward mobility, the ability to move up a peg or two, is an important part of the American dream.

But it can also turn into an American nightmare.

Especially for a small businessman who's laid out a lot of his hard earned money for a computer he's outgrown and for application software that no longer applies.

And we don't have to tell you what a nightmare it can be for the guy who has to rewrite all that software for that businessman.

You.

The Commercial Systems Supplier.

Well, now Data General, a company that supplies systems to 82 of the Fortune 100 Companies, has rewritten that scenario.

With the new Data General Commercial Systems Family.

Like any family, ours starts out small. The CS/5 is a single terminal desktop computer, fully capable of handling all the applications a small business requires. From these not so humble beginnings, we move up to a small business system, the CS Series 100, that can support from 2 to 9 terminals and do things like billing, inventory

WARDLY COMPUTER.

and word processing simultaneously. Finally we grow into a high speed multi-function business system (CS Series 200) with the ability to handle up to 25 terminals.

Yet with all this moving up, there's very little moving out. For these systems are compatible and require a minimum of replacement.

Likewise, the application programs that run on the CS/5 run unchanged on the CS Series 100, on the CS Series 200 and on up through Data General's most sophisticated information systems.

So a business can use the same software as it goes from small to medium to large.

Without retraining its people. Or changing its methods.

And you can install the same software as you go from small to medium to large businesses.

Without rewriting or redocumenting.

For unlike people, the Data General Commercial Systems don't start speaking a different language as they grow.

Interactive COBOL and Business BASIC are spoken here. From our smallest operating system through our largest.

And just in case we have to draw you a picture, new Business BASIC software

packages, (the BUSI Series) are now capable of creating business graphics, from pie charts to eye charts (BusiPEN), word processing (BusiTEXT), and a program/report generator (BusiGEN).*

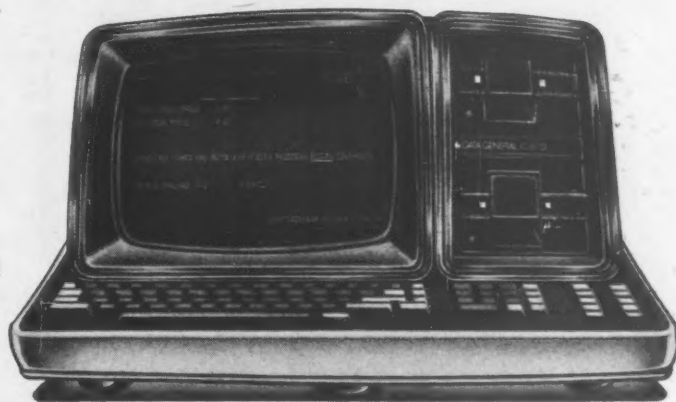
So, what you have here is a system that beats the system. With the latest hardware, software and support services, it optimizes your time, your software investment and your customer's money.


If you are interested write:

Data General, 4400 Computer Drive,
C228, Westboro, MA 01580.

Maybe we can make you upwardly mobile, too.

*On the CS/5 only BusiTEXT is currently available.



 **Data General**

WE ENGINEERED THE ANXIETY OUT OF COMPUTERS.

Disk Drives Out For Apple III

SANTA ANA, Calif. — The Micro-Sci Division of Standun Controls, Inc. has introduced a line of disk drives for the Apple Computer, Inc. Apple III computer.

The Model A3 with 143K bytes reportedly has the same capacity as the Apple Disk III, but at a lower price. The A73 has twice the capacity at 286K bytes with track-to-track access of 5 msec.

The A143 offers the same 5-msec seek rate plus 572K bytes of capacity. All utilize the existing Apple III power supply and controller. The A3 costs \$449, the A73 costs \$649 and the A143 costs \$799, a spokesman said from 2158 S. Hathaway St., Santa Ana, Calif. 92705.

Aimed at Small Law Firms

Turnkey Time Accounting System Bows

NEW YORK — Turnkey Information Processing, Inc. has introduced a service/turnkey time accounting system aimed at smaller law firms with up to 25 lawyers.

Turnkey Time Accounting (TTA), reportedly based on the Prime Computer, Inc. Model 450 with 2M bytes of main memory and 300M bytes to 4.8G bytes of disk storage, offers time and disbursements accounting, general ledger, accounts receivable, docket control, records management and conflict-of-interest applications.

The service is available on a per use basis and includes 24-hour computer access. The cost is approximately \$150/man/mo and can include the free use of a terminal and 120-char./

sec printer.

Prices for a turnkey system vary greatly depending on the size of the

law firm, a Turnkey Information Processing spokesman said from 500 Fifth Ave., New York N.Y. 10110.

Umerlin Lets TRS-80 Users Run Software Developed for IBM Micro

CULVER CITY, Calif. — Micro Projects Engineering Co. has announced Umerlin, an interface that reportedly allows users of Radio Shack TRS-80 Models I and III processors to use software developed for use with the IBM Personal Computer.

The self-contained Umerlin unit incorporates an Intel Corp. 8088 microprocessor, 64K bytes of direct ran-

dom-access memory (expandable to 256K bytes) and 8K bytes of erasable programmable read-only memory, the vendor said.

The TRS-80 processor is used as a slave I/O processor for Umerlin access to the Radio Shack CRT terminal, floppy disks and serial and parallel ports, a spokesman for the vendor said.

Umerlin includes Digital Research, Inc.'s CPM/86 operating system and costs from \$1,195. The vendor is located at Suite C, 10810 W. Washington Blvd., Culver City, Calif. 90230.

IBM Micro Gets Increased Storage

CANOGA PARK, Calif. — Interface, Inc. has expanded to 2.6M bytes, the maximum storage available on its 5¼-in. floppy disk drives for IBM Personal Computers.

The firm's floppy disk drives feature a double-sided, double-density disk that provides 650K bytes of IBM formatted storage. By adding two drives internally and using two external drives, IBM Personal Computer users can achieve the 2.6M byte storage capacity, the vendor said.

A quad-density, rack-mountable 650M-byte drive costs \$450 and a quad-density, externally-mounted 650M-byte drive costs \$560, the vendor said from 7630 Alabama Ave., Canoga Park, Calif. 91304.

Combination Board Bows for IBM Micro

SUNNYVALE, Calif. — Data Mac Computer Systems Co. has announced a combination memory expansion and asynchronous communications controller board for the IBM Personal Computer.

The board contains 64K- to 256K bytes of memory and reportedly can be configured with either one or two asynchronous communications devices. The board reportedly frees I/O slots in the Personal Computer.

The board costs between \$550 and \$1,239, depending on the configuration, the vendor said from 680 Almaror Ave., Sunnyvale, Calif. 94086.

Apples Get 'DSI-A306'

MOUNTAIN VIEW, Calif. — Davong Systems, Inc. (DSI) has announced a line of hard-disk expansion systems for the Apple Computer, Inc. Apple III.

The DSI-A306, with 5M bytes formatted or 6M bytes unformatted, costs \$1,995; the DSI-A312, with 10M bytes formatted or 12M bytes unformatted, costs \$2,495; and the DSI-A319, with 15M bytes formatted or 19M bytes unformatted, costs \$2,995.

Davong is located at 1061 Terra Bella Ave., Mountain View, Calif. 94043.

"All you dumb terminals: smarten up, or else."



And since there's no duplicate keyboard and CRT to accommodate, valuable desk and office space is saved.

There's no teaching expense or time loss because people will be using equipment they're already familiar with.

In addition, the TC1 interfaces with the terminal and host without modification and enables use of both computer and host simultaneously. And since it uses CP/M, the Avatar enables the terminal to run a complete range of inexpensive application programs.

We make the company's database home base for all decisions.

Most important, the Avatar permits easy access and file transfer with the host.

So Avatar assures absolutely consistent integration with the information base, resulting in accurate analysis and reporting.

And, when you don't have garbage in, you won't get garbage out.

Smarten up. Call us today.

If you want to reduce costs, assure information integrity and increase productivity, start by making dumb terminals more productive.

Contact Brad Hebert, vice president, 18 Lyman Street, Westboro, MA 01581, or call (617) 366-5300. He'll show you how easy and inexpensive it is to give a dumb terminal a mind of its own.

Announcing Avatar™ TC1, the first Universal Terminal Converter: turns any dumb terminal into a desk-top computer in minutes. And saves money while doing it.

In less than five minutes, requiring only a screwdriver, the Avatar TC1 expands the dumbest dumb terminal so it also functions as a very intelligent CP/M® desk-top computer.

One with advantages that can't be gotten from any personal business computer. Not IBM's, not Apple's, not anyone's.

To start with, the Avatar TC1 costs less than most desk-top computers.

AVATAR™

We make dumb terminals smart.

© 1982 Avatar is a product of 3R Computers Inc. "CP/M" is a registered trademark of Digital Research, Inc.

Detach here, moisten and seal envelope securely before mailing.

Fold and insert order form (attached through binding) and remittance here.



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 709 FRAMINGHAM, MA 01701

postage will be paid by



**375 Cochituate Road, Rte. 30
Box 897
Framingham, MA 01701-9985**



CALL IBM'S BLUFF.



CALL 800-523-6529.*

Decision Data Delivers More CRT Work Station For Your IBM 34 or 38. Much More.

You may have heard that IBM has a new work station similar to ours. Wishful thinking!

Almost the only thing the same is the price: \$2,100.

We give you more, much more for your money.

We deliver a screen that's 15 inches to their 12 — with 56% more workable area — plus an 8x16 dot character matrix compared to their 7x11 matrix. And we help you get much more out of your screen.

The Decision Data CRT Work Station displays a 188 character set. They are limited to 96.

Our screen — like theirs — displays 1,920 characters, but our type is larger — with finer resolution.

Our movable keyboard offers more than simple efficiency. It's ergonomically designed, right down to the palm rest.

And the numerical pad can also function in either calculator mode or telephone key-pad mode.

Many other features like the cursor position indicator and the expanded error message display — plus automatic dimming — lessen operator fatigue. Our unit is also smaller, takes less table space, weighs less and has no fan noise.

We could go on...listing many more options than IBM.

But maybe you should call us now to call Big Blue's bluff. And learn, too, that our service is as great as our product — on-call 24 hours a day — seven days a week — nationwide. And it's less expensive.

So, if you're looking for performance. Price. Features. Options. Service. And especially *availability*. Call the people who deliver more for your money (with choice of flexible leasing plans).

While Big Blue makes announcements, we're ready to show you our winning hand. And deliver extra productivity, too.



**Decision
Data
Computer
Corporation**

Box 22092, 100 Witmer Road, Horsham, PA 19044-2282

☐ Tell me more about the Work Station that delivers more. Better still, I will call toll free: **(800) 523-6529**. *In PA, call: (215) 674-3300.

Name _____

Company _____

Address _____

City _____

State _____

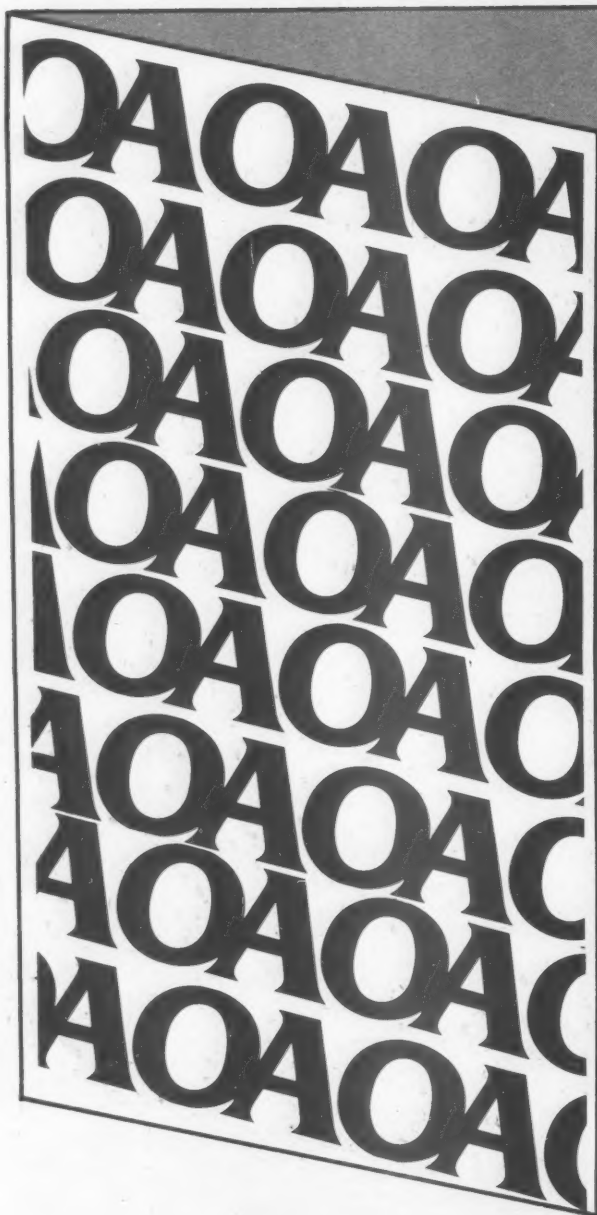
Zip _____

Telephone _____

My system is a 34, 38, 360, 370, 303X, 4300, DEC., H-P, DG, etc. _____

IT'S YOUR DECISION.

Coming up in *Computerworld OA* **Selling Office Automation to Your Organization**



The next issue of *Computerworld OA* will focus on selling office automation within an organization. This special report will feature the human angle of office automation and highlight the strategies of selling the concept of OA to top management and end-users in an organization. You'll see articles on implementation techniques, feasibility studies, human interface, ergonomics and productivity.

And, of course, you'll see several articles on current happenings in all aspects of OA.

There will be bonus distribution of this issue to attendees of the Info '82 Show in New York this October.

The issue date is September 29th.

For more details on *Computerworld OA* and the people who read it, just contact your local *Computerworld* representative, or call Bob Ziegel, Vice President at (617) 879-0700 for all the information.



COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

375 Cochituate Road, Box 880, Framingham, MA 01701/(617) 879-0700

SALES OFFICES

BOSTON

Chris Lee
Ed Marecki
Joe Fitzhugh
Kathy Doyle
Diane Sukey
(617) 879-0700

CHICAGO

Newt Barrett
Chris Lee
Arthur Kossack
Jan Raska
(312) 827-4433

NEW YORK

Mike Masters
Peter Senft
Doug Cheney
Ray Corbin
Fred LoSapio
(201) 967-1350

SAN FRANCISCO

Bill Healey
Bill Milione
Rick Jamison
Ruth Gordon
Eileen Dunn
(415) 421-7330

LOS ANGELES

Jim Richardson
Bob Hubbard
Delbra Pendergrass
Beverly Raus
(714) 556-6480

What Do Secretaries Want in a Workstation?

By Tom Henkel
CW Staff

SAN JOSE, Calif. — A big screen. High-quality printing. Communications with a host processor. Multitasking and local processing capabilities.

Those are features that secretarial workers would like to see in a workstation, according to a recent study IBM made of personnel at its San Jose Research Center here.

The authors of the study — Cristine V. Bullen, who is with MIT's Center for Information Systems Research, and John L. Bennett and Eric D. Carlson, both located at IBM's San Jose Research Laboratory — evaluated how the secretarial

staff at the IBM research facility use workstations. They presented their conclusions in one of five office systems papers in the current issue of the *IBM Systems Journal*.

The researchers used an evaluation method called the Office Analysis Methodology (OAM), developed at MIT. The OAM was designed to explore office automation issues at various types of organizations, such as manufacturing, high-technology and service industries, according to the report.

The study reveals the major complaint secretaries lodge against their workstations is that they are not given enough formal training in how to use them.

And the secretaries said self-education takes too long.

"[Secretaries] recalled their first days using the system with some sense of accomplishment, but they did not think it was an efficient way to learn. They were also frustrated in that they suspected the system contained a number of additional features that they would find valuable, but they had no easy way to confirm this," the study said.

In addition, secretaries said that because of poor documentation, they often had to rely on word of mouth to learn about new features. Likewise, lunchroom gatherings, as well as other

(Continued on Page 96)



H. Alfred Colby, senior vice-president of DP, confers with Diane Capstaff, Hancock's director of office of the future.



Vernon Skipper, Hancock's director of office automation, evaluates the IBM Personal Computer.

CW Photos by J. Bartimo

Must Maintain Compatibility Standards

Hancock Tries to Stay On Heels of WP

By Jim Bartimo
CW Staff

BOSTON — The one problem facing John Hancock Mutual Life Insurance Co.'s office automation effort has been keeping up with the demand for word processing, according to Diane Capstaff, the firm's director of office of the future.

With a mixed shop of predominantly IBM and Digital Equipment Corp. data processing equipment and predominantly Wang Laboratories, Inc. word processing equipment, the sprawling, worldwide insurance company has to maintain certain compatibility standards, added H. Alfred Colby, senior vice-president and DP head who works closely with Capstaff.

"There's a danger in an organization this size of losing control, and then you won't be able to connect [the hardware] later on," Colby said. "People who want word

processing have to go to Diane and have a study done before it can be installed." An IBM Systems Network Architecture (SNA) requirement must also be met.

The office of the future at John Hancock began with a study, according to Capstaff. "A couple of years ago, we were looking at the demographics and found we won't be able to find the people we'll need by the end of the decade," she said.

The decision to automate certain jobs for the future did not eliminate jobs in the present, Capstaff said, but some jobs were upgraded. Job grades one and two — lowest on the personnel ladder and once plagued by high attrition and temporary help — have been eliminated completely. Those jobs are now part of other higher level positions that are assisted by automation and are more meaningful, Capstaff said.

"Our approach has been very different," she noted, "We had a seminar on how the office of the future would effect [the clerical] people. We did that before we went to the senior people. The secretaries knew about it first."

Before installing four Wang VS minis, secretaries tested other systems, "because they were the ones who would be working on them every day," Capstaff said. A training department for new and promoted employees was also established that has been reported to be working double shifts with two instructors.

"We've done a lot on the semi-professional level," the director continued, pointing out that people at the secretarial level now have career paths to programming in the DP department or other related areas in office automation.

(Continued on Page 96)

Top screened players for rent. Immediately.



Televideo makes the most popular line of CRTs in the world. Now Televideo's top products can be yours within 24-hours through Leasametric, the world's largest DP and electronic test equipment rental company. Other Leasametric alternatives include rental with option to buy, lease, and purchase. Flexible financing is available. The Televideo Model 925 offers ergonomic design, detachable keyboard and editing capabilities. The 950 adds programmable keyfunctions. Choose the basic Model 910 for maximum economy. All models feature Televideo's eye-easy green phosphor screens. The number to call is 800-447-4700. In Illinois, call 800-322-4400. In Canada, call 1-800-268-6923.

Rent the best names in the business
from the best name in the business

Leasametric

Study Probes Secretaries' Needs

(Continued from Page 95)
social situations, are often forums to pass on warnings about flaws in the system, according to the study.

Printer problems are another pet complaint among IBM secretaries, according to the report.

Specific complaints include: the printer is located several hundred feet from the secretarial work area, it is not safe to print personal or confidential text on a semi-public printer and paper-loading techniques are difficult while restrictions on the type of paper stock complicate the secretaries' jobs.

Terminals, too, received some disfavor. Secretaries said it is difficult to proof-read text on CRT terminals and the terminals take up too much space on their desks, according to the study.

In spite of some complaints, the study reveals IBM secretaries overwhelmingly preferred office automation technology to manual methods.

"At the San Jose Research Laboratory, we did not see

any reluctance to use new technology," the study stated.

"Obviously, the high-technology environment has a significant influence in creating an atmosphere for acceptance." In addition, the study concluded, given the somewhat demanding work load on secretaries at IBM, they would be "hopelessly inundated with work," without some form of automation.

Management Package Out For CPT's 8500 WP Units

MINNEAPOLIS — CPT Corp. has announced Target Task, a project management package for the firm's 8500 series word processing units.

The package reportedly allows a business to plan and adjust a product schedule in order to meet a required completion date or to match an exacting budget. Features include the ability to review time and cost factors as well as project duration.

The package is capable of handling projects with up to 350 tasks, the vendor said.

The package costs \$330 from CPT at 8100 Mitchell Road, P.O. Box 295, Minneapolis, Minn. 55440.

Keeping Up With WP

(Continued from Page 95)

The DP department maintains a number of applications that overlap with some OA applications, such as graphics. It also assists the office of the future with an information center, Colby explained.

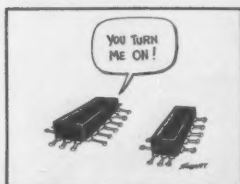
One example of DP support for OA is when the same letter is sent to a number of policy holders. "We can write part of the letter on the Wang system and go into the IBM mainframe for the names and addresses," Colby said.

Upper management has long been exposed to automation but is only now toying with a handful of Apple Computer, Inc. and IBM micros. Word processing, photocomposition and other print-related systems vital to an insurance organization are in the hands of 200 to 300 workers, but Capstaff admits that automation has yet to reach middle management.

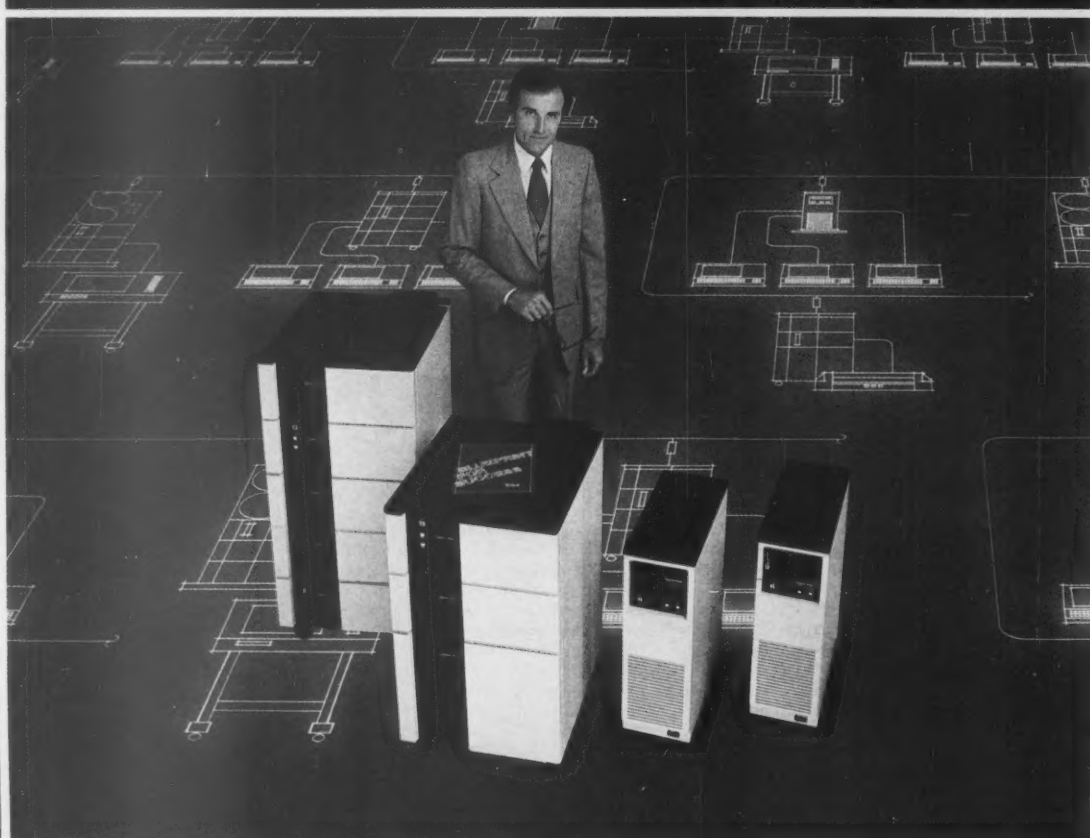
"We're hoping that will change with the introduction of electronic mail," which is still under study by her department, she said.

Another development pegged for the future is word processing for the 500 field locations around the world that are now linked to the office here via SNA.

Capstaff's group is in charge of servicing the company by acting as an OA consultant to the other departments. Both she and Colby answer to the same vice-president for corporate operations who in turn answers directly to the president of the company, Colby said.



Zilog's System



DP Function Available for IBM Displaywriter

RYE, N.Y. — IBM has announced licensed programs that enable users of its Displaywriter office system to develop and run data processing applications.

The DP function for Displaywriter is provided by the UCSD P-System, a complete user-oriented operating system. The marketing rights for the UCSD P-System have been acquired from Softech Microsystems, Inc. of San

Diego, Calif.

The system features the Runtime System, said to allow users (even those without programming experience) to run prewritten applications programs. Also featured is the Development System for writing new applications programs in several languages, including Basic.

The UCSD P-System requires no additional hard-

ware beyond an IBM Displaywriter with 128K bytes or more of memory and a dual-drive diskette unit.

Licensed programs will be available on diskettes in December. The Runtime System is available for a one-time

charge of \$375.

The Development System is available for a one-time charge of \$950.

For HP 3000

'Speededit' Gets Enhanced Version

IRVINE, Calif. — Bradford Business Systems, Inc. has announced an enhanced version of its Speededit screen

editor for Hewlett-Packard Co. HP 3000 systems.

The enhanced package has added features to handle of-

fice automation functions such as electronic mail, tickler files, room and equipment scheduling, mathematics functions and general text-editing and program-development functions.

The package reportedly allows HP 3000 users to edit, compile and check syntax on Cobol I, Cobol II, Fortran, RPG and Pascal programming languages.

The office automation features allow users to send, list, receive and review messages from other users on the system, the vendor said.

The package costs \$3,500, and a demonstration tape is available for \$100, the vendor said. Bradford is located at 4920 Barranca Pkwy., Irvine, Calif. 92714.

Project Links Mail Systems At Colleges

PRINCETON, N.J. — The Carnegie Corp. has approved funding for the pilot phase of a project that will link local campus-based electronic mail systems at colleges and universities.

Called Mailnet, the project is a joint effort of Educom/Edunet, MIT and 15 participating institutions aimed at creating a technically sound intercampus electronic mail system.

Educom is an interuniversity communications council. Edunet is an international computing network and a subsidiary of Educom.

With Mailnet, users will be able to send and receive messages and files via terminals connected to their campus's existing electronic mail system. Hardware and software on MIT's central computing facility will act as an electronic hub for the transfer of messages between campuses.

More information on the network is available from Elizabeth Kilcoyne at Edunet, P.O. Box 364, Princeton, N.J. 08540.

8000 family spells OEM success.

Zilog's System 8000 is a growing family of totally compatible general purpose 16-bit microcomputers designed for high performance and reliability. Priced from \$13,000 to under \$40,000, they are rapidly becoming the choice of successful OEM's for a growing variety of applications.

The entry level Models 10 and 11 give you 256 KB of parity memory, and an 18 MB Winchester disk for on-line storage. They support up to eight users, making them the perfect low-cost micros for commercial users.

For higher performance, choose the Model 21. It features 1 MB of ECC memory, a 32 MB Winchester disk and a 17 MB cartridge tape for backup.

For the highest performance of all, select the Model 31, the remarkable micro comparable in performance to minis, yet priced far less. It delivers up to 4 MB of ECC memory, plus up to 320 MB of SMD compatible disk and offers an optional 9 track tape. Model 31 also supports up to 24 users simultaneously.

Best of all, the System 8000 family has been designed to take full advantage of the powerful UNIX* operating system. System III has been added to further enhance application software development, making System 8000 computers your best choice to run high level languages such as BASIC, COBOL, FORTRAN 77, C, Pascal, PL/Z/SYS and Z8000 assembler. All software is code and data compatible, allowing for total portability among all family systems. Inside all System 8000s are the high performance VLSI components you've come to expect from Zilog. The Z8000™ is a 16-bit CPU with 16 general purpose registers, an 8 MB address space and expanded capability to perform 8-bit, 16-bit and 32-bit operations. In addition, each system can communicate via the Z-NET II local area network, and with other UNIX-based systems as well.

Zilog's System 8000 family. Flexible, cost-effective solutions for today's OEM applications.

Let us spell success for you. Call 800-447-4700, toll free today. (In Illinois, 800-322-4400.) Ask for your free personal copy of the Zilog "Blueprint for Success" kit. The kit contains detailed information on Zilog's System 8000 family and Zilog's unique OEM opportunities.

INTERNATIONAL
Paris 778-11-33
London (0628) 39200

Munich 49-89-612-6046
Tokyo 03-587-0528

Zilog Pioneering
the Microworld.

An affiliate of EXON Corporation

*UNIX is a trademark of Bell Laboratories. Zilog is licensed for Version 7 and System III by Western Electric, Inc.

SEE OUR COMPONENT PRODUCTS AT
MINI/MICRO '82, BOOTH #702.



SYNAPSE TRANSACTION PROCESSING. IT DEALS WITH THE FUTURE YOU CAN'T PREDICT.

Look. Even the experts can't predict. Back in 1901, no less an authority than Wilbur Wright, working in his bicycle shop, said that man would not fly for another 50 years. And, of course, *he* ended up flying just two years later.

So all you can really say about the future is that it's full of surprises. Especially if your future's linked to transaction processing. It's the one area where you use computers in a very untraditional way: to accommodate and expand your business with the objective of increased revenues, rather than mere cost-reduction alone.

But, now that the SYNAPSE N+1™ is here, the future can be as vague as it likes. Because no matter how demanding your market, the fault-tolerant SYNAPSE EXPANSION ARCHITECTURE™ approach lets you grow. Limited only by your market, not your computer.

You'll accommodate forecasting errors because you can expand a SYNAPSE N+1 without wheeling out a small system and wheeling in a big one. The N+1 can

grow from a super-mini level up to the largest commercial mainframes—simply by adding processors, I/O and memory modules into the existing cabinet.

To create, not a loosely-coupled network of minicomputers that need to be reloaded and retuned with every expansion. But the first tightly-coupled, multiple-processor, self-tuning transaction processing system.

Up to 28 processors, working in parallel, handle jobs from a single list in shared main memory. To process the list faster, you add more processors. (Picture it like a bank lobby with a single line served by all tellers. To make the line move faster, you simply add more tellers. There's no reshuffling, because the workload is distributed automatically.)

You'll have less hardware expense because our N+1 systems architecture doesn't require two of everything to

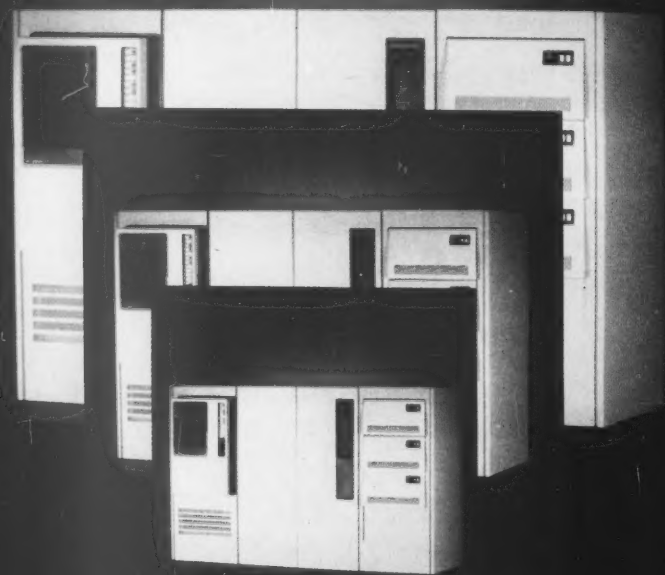
achieve fault-tolerance.

You'll have lower life cycle costs and less risk of data loss because our high-performance Relational Data Base Management System insures data integrity. Our SYNTHESIS™ software accelerates development. And our APPLICATION DICTIONARY™ facility simplifies changing your applications in size and scope.

Now, then. If like Wilbur Wright, you'd prefer to fly while your competitors wrestle with what came out of the bicycle shop, just give us a call at (408) 946-3191.

Or you can do nothing. And simply watch for your *Computer-world* next week, when the future you've always wanted will be the centerfold.

Synapse
Computer Corporation
THINK AHEAD.



Copyright © 1982 Synapse Computer Corporation, Corporate Communications Department, 801 Buckeye Court, Milpitas, CA 95035. (408) 946-3191.
SYNAPSE N+1, SYNTHESIS, SYNAPSE EXPANSION ARCHITECTURE, and APPLICATION DICTIONARY are trademarks of Synapse Computer Corporation.



CDC's Applications Center for Manufacturing in Waltham, Mass., offers a variety of systems and consulting services.

CDC Opens Center; Features Manufacturing Applications

WALTHAM, Mass. — Control Data Corp. has opened its first manufacturing applications center here.

Although the center was ostensibly set up for casual use of the company's manufacturing applications, it is "tightly coupled to CDC's sales effort," explained Alan Christman, CDC's general manager of manufacturing industry marketing. Sales of computer-aided design and computer-aided manufacturing (CAD/CAM) systems tend to have a long decision cycle and are dependent on the efficient use of the system, Christman maintained.

Discussions by industry experts at recent conferences on graphics and CAD/CAM have highlighted the fact that CAD/CAM systems are not being used with maximum efficiency. Christman noted that a recent survey by a market research firm indicated that 60% of the CAD/CAM users polled would purchase systems other than the ones they are currently using.

Consequently, if users have an opportunity to become comfortable with the capabilities of

such systems with minimal capital outlay, they are more receptive to installing them on-site.

(Continued on Page 100)

Intel to Provide IBM With 2164A Technology

SANTA CLARA, Calif. — Intel Corp. has entered into an agreement to provide IBM with all circuitry, masks and process technology for the 64K Intel 2164A random-access memory (RAM) chip.

Although the firms did not discuss the specific terms of the agreement, IBM reportedly is considering using the Intel 2164A chip technology at its semiconductor plant in Burlington, Vt.

The firms refused to say whether the arrangement carried the promise of future chip production business for Intel. However, "you might surmise that is the case," one observer said.

IBM, one of the world's largest chip producers, manufactures its own 64K RAMs for use in its 4300, 8100 and System/38 processors.

The arrangement is an endorsement of Intel's Hmos D3 technology, a company spokesman said. Intel's 64K RAM is said to be about twice as fast as the IBM 64K RAM. The 2164A also features redundancy — duplication of critical features of the chip that reduce failures and increase reliability. IBM uses this feature in its chip.

IBM considers the technology complementary to its own products, which use Samos technology, the Intel spokesman noted.

In the past, the Japanese have dominated the 64K RAM market, securing an estimated 70% to 80% share of that market. However, the Japanese vendors' market share is expected to drop to about 50% this year.

Intel expects to ship several million 64K RAMs to various customers this year.

Datapoint Earnings Down to \$2.4 Million From Last Year's \$48.7 Million

SAN ANTONIO, Texas — As expected, Datapoint Corp. reported precipitously lower earnings for fiscal 1982.

The company reported earnings of \$2.4 million or 12 cents per share for fiscal 1982 compared with earnings of \$48.7 million or \$2.45 per share last year. Revenues totaled \$508 million, up from \$449 million in 1981.

Datapoint Chief Executive Officer Harold E. O'Kelley said fourth-quarter orders continued to be weak, reflecting the general economic situation. He also noted that additional receivable and inventory provisions were made during the final quarter.

For its fourth quarter, Data-

point reported earnings of \$3.3 million or 16 cents per share on revenues of \$140 million compared with earnings of \$13.4 million or 66 cents per share on revenues of \$121 million in the same quarter of fiscal 1981.

The financial results reflect the fully consolidated accounts of Flex, Inc., the holding company that owns Inforex, Inc.

Cost-Cutting Moves

During the past several months the firm has made several cost-cutting moves, among them closing a plant in Waco, Texas, and laying off management and system support personnel at headquarters and at various regional

offices. [CW April 5, April 19].

Adding to its financial woes, Datapoint is currently in the throes of several stockholder suits against the company, its directors and auditors, alleging misrepresentations in connection with the issuance of financial statements and disclosure of the firm's financial position over the past two years. Those suits also allege insider stock-trading activities. Originally there were 16 suits, but many of these have been consolidated, according to a company spokesman. The litigation is still in preliminary phases, he said.

These developments resulted in the resignations of five marketing executives in May

(Continued on Page 100)

No-Nonsense Traffic Cop

The Beall Channel Switch. Prevents computer traffic jams by directing critical on-line services to another CPU when failure occurs. Allows specific peripherals to serve more than one computer. Redrives all CPU signals to give you far more flexibility for physical placement of peripherals.

And Beall does all of this less expensively, more reliably and with less opportunity for operator confusion than anyone else.

We make five basic models to provide up to eight switchable interfaces each of which can be logically connected to as many as eight CPUs.

Want to summon more facts? They're in our new brochure. Write or call for it today.

John Beall & Company, Inc.

9103 Third Avenue • North Bergen, N.J. 07047 U.S.A. • 201/854-3582



Executive Corner

- Martin S. Albert has been promoted to president of Cambrian Systems, Inc.
- Robert C. Coolidge has been promoted to president and chief marketing officer for Shasta General Systems, Inc.
- Edwin L. Hughes, president and chief executive officer of Florida Data Corp., has been elected chairman of the board.
- Richard Canfield has been named vice-president of manufacturing at Datamac Computer Systems, Inc.
- Jim Nakasuji has been promoted to senior vice-president and Beau Vrolyk to vice-president of marketing for Codata Systems Corp.
- Dudley F. Clark has been named senior vice-president of development; John B. Landry, senior vice-president for research and development; and Thomas W. Keown Jr., vice-president of

the Human Resources Division at McCormack & Dodge Corp.

- Donald L. Miller has been promoted to vice-president of sales for Graphics Technology Corp.

- Joseph G. DiGiacomo has been named vice-president of Unix product development for the Computer Technology Group.

- William O. Ostler has been named vice-president of finance for Pyramid Technology Corp.

- E.D. Garver has joined Radnor Information Services, Inc. as vice-president of marketing.

- Frank Zurcher has been appointed vice-president and general manager of Televideo Systems, Inc.'s Computer Systems Division.

- Bronson H. Purdy Jr. has been named vice-president of corporate marketing for Microdata Corp.

- Carle Robbins has been promoted to vice-president of sales for Olympia USA, Inc.

- Robert G. Kaseta has been elected vice-president of engineering of Vermont Research Corp.

- Robert L. Plouffe has been named executive vice-president of Planning Research Corp.'s Government Information Systems.

- Louis Palmer has been promoted to vice-president of staffing at Information Industries, Inc.

- A. Dale Hiatt has been named vice-president of manufacturing at Quantum Corp.

- James J. Hawkins has been selected vice-president of sales and marketing for ECS Telecommunications, Inc.

- Robert A. Sternberg has been named chief operating officer at Sidereal Corp.

- Kenneth J. Simmons has been appointed vice-president of research and development for Wilson Laboratories, Inc.

- Ross Trenholm has been named vice-president of field services at Software International Corp.

- Michel A. Cholet has been appointed vice-president of Pacific Bancorporation's integrated network services.

- Harold W. Miller has been elected vice-president and group executive of ITT Telecom North America.

CDC Center Opened

(Continued from Page 99)

Ideally, firms considering such purchases would use the center for a couple of months and then have a workstation installed for a few months.

The center features a number of rooms that are outfitted with workstations to perform CAD/CAM applications.

The applications center features the availability of more than 100 industry-specific applications that are tied into CDC's Cybernet services network.

System Was Key

Although the concept of the center has been on the drawing board for quite awhile, the introduction of the company's Integrated Computer-Aided Engineering and Manufacturing (Icem) software system last November was the key to starting the innovative mar-

keting tack, according to Christman.

Much of the software included in the Icem package had been available prior to that time, but had not been integrated.

CDC is testing the waters with the initial applications center here, which is housed in the firm's regional sales office.

Other Centers

The company also has a center for petroleum applications in Houston and another one for as-yet unspecified applications in Sunnyvale, Calif.

The basic charge for use of the workstation is \$50 per hour, with additional charges for consultation, according to CDC.

Further information can be obtained from the firm, which is located at 60 Hickory Drive, Waltham, Mass. 02154.

Essentially Speaking...

What if someone inadvertently switched your disk drives off? **DOWNTIME!!!**

Why not protect your system by ensuring that your IBM 3370 or 3375 disk drives are not accidentally switched. For as little as \$19.95 a "PRO-TECH 3300" covers your disk control panel to prevent disaster from occurring. Durable, transparent, self-installing, the PRO-TECH 3300 does just one thing... gives you Peace of Mind. The PRO-TECH 3300 fits all models of IBM 3370 or 3375 disk drives and can be slipped on or off in seconds. Money back guarantee if not fully satisfied.

Cost: \$19.95 plus shipping and handling cost (\$2.50 first unit, \$1.15 each additional), no sales tax, TO: **Essential Computer Products**
8 Jefferson Drive, Londonderry, N. H. 03053
Tel. 617-938-1479 Call for quantity discounts!
Allow 4-5 weeks for delivery

Earnings Dip At Datapoint

(Continued from Page 99)

[CW May 24].

"It would be foolish to pretend the short-term morale of the work force has not been affected by the negative publicity," said Vince Balhorn, vice-president and group executive of the Operations and Service Group, during an interview prior to the release of the firm's financial results.

Despite these difficulties, Balhorn said that he did not foresee any dramatic structural changes in the organization.

In August, the firm divided its product lines into communications and office and computer systems, creating two executive vice-presidential slots for those business areas.

Daniel A. Hosage is the executive vice-president for communications management products. Lawrence Segligman, formerly with Data General Corp., was recently named executive vice-president of office and computer products.

How do you access the largest single source of information on software for APPLE, BURROUGHS, CP/M, DATAPOINT, HONEYWELL, IBM (third party), NCR, TRS-80 and a host of other computer systems — with satisfaction guaranteed?

Call

1-800-531-5955

In Texas, 512-340-8735

SOFTSEARCH™
software locator service

The world's first software locator service.
CCS Incorporated P.O. Box 5276 San Antonio, Texas 78201

TERMINALS FROM TRANSET

PURCHASE PLAN • 12-24 MONTH FULL OWNERSHIP PLAN • 36 MONTH LEASE PLAN

DESCRIPTION	PRICE	12 MONTH	24 MONTH	36 MONTH
LAS3 DE-Center IV Forms Ctrl.	\$1,885	\$165	\$58	\$40
LA180 Letter Printer RD	1,995	190	106	72
LA120 DE-Center III KSR	2,295	220	122	83
LA120 DE-Center III RD	2,095	200	112	75
LA12A Portable DE-Center	2,350	280	155	106
VT180 CRT DE-Cscope	1,695	162	90	61
VT101 CRT DE-Cscope	1,195	115	67	43
VT125 CRT DE-Cscope	3,295	315	185	119
VT131 CRT DE-Cscope	1,745	167	93	63
VT132 CRT DE-Cscope	1,995	190	106	72
VT18AC Personal Computer Option	2,395	230	128	86
TT45 Portable Terminal	1,595	153	85	58
TT65 Bubble Memory Terminal	2,595	249	138	93
TT940 CRT	1,795	173	96	65
TT720 Portable KSR, 120 CPS	1,795	173	96	65
TT767 Portable KSR, 120 CPS	2,195	211	117	80
TT810 RD Printer	1,695	162	90	61
TT820 KSR Printer	2,195	211	117	80
ADM3A CRT Terminal	595	57	34	22
ADM3 CRT Terminal	645	62	36	24
ADM32 CRT Terminal	1,165	112	65	42
CIT-101 CRT	1,525	147	82	55
CIT-161 Color CRT	2,675	257	143	97
CIT-427 Color Graphic CRT	3,095	297	165	112
910 CRT Terminal	650	62	36	24
925 CRT Terminal	850	82	46	31
950 CRT Terminal	1,075	103	57	39
Letter Quality, 7715 RD	2,695	259	144	98
Letter Quality, 7725 KSR	3,195	307	171	115
2630 KSR Printer 30 CPS	1,195	115	67	43
2120 KSR Printer 120 CPS	2,195	211	117	80
MX-80 F.T. Printer	745	71	42	27
MX-100 Printer	895	86	48	32
ES400 4 Channel Stat Mus	1,525	147	82	55
ES600 6 Channel Stat Mus	2,050	197	110	74

*DEC is the trademark of Digital Equipment Corporation

FULL OWNERSHIP AFTER 12 OR 24 MONTHS • 10% PURCHASE OPTION AFTER 36 MONTHS

MICROCOMPUTERS

APPLE • COMMODORE • HP87 • DEC

ACCESSORIES AND PERIPHERAL EQUIPMENT

ACOUSTIC COUPLERS • MODEMS • THERMAL PAPER • RIBBONS • INTERFACE MODULES • COPY DISK UNITS

TRANSET CORPORATION

1945 ROUTE 22 • UNION, N.J. 07083 • (201) 688-7800

TWX 710-985-5485 800-526-4965 OUTSIDE N.J.



Make the most of your hardware

SWITCH-IT

A Switch Box can add to the versatility of your equipment — permanent connections avoid the need to change cables manually to and from terminals, modems, CRT's, for example. A way to make CPU's or peripherals do extra duty. More than a dozen different kinds of ABC and ABCDE switch boxes, and Transfer Boxes in stock. Just for instance:

RS-232 ABC box \$99.50
RS-232 ABCDE box \$198.00

(Female connectors standard; male available on special order.)

For NEW CATALOG send your business card or clip this ad to your letterhead and send to office nearest you... or call:

East: 722 Danbury Road, Ridgefield, Connecticut 06877
(203) 438-9684 TWX-710-467-0668

West: 3001 Contract Avenue, Las Vegas, Nevada 89101
(702) 382-6777

ds Data Set
cc Cable Company, Inc.
The Company with a lot of Connections

Supershorts

General Instrument Corp.'s new satellite systems unit will be responsible for the design, manufacture and marketing of all satellite-related products. The unit, based in Toronto, Canada, will focus initially on dish antennas, low-noise amplifiers and receivers.

GTE Satellite Corp. has started construction in Los Angeles, Chicago and Houston on earth stations for its satellite communications system. The stations are scheduled to become operational in November and will provide voice and data transmission between these cities and, early in 1983, with New York.

Harris Corp.'s Telephone Systems Division announced that 11 of its digital-switching systems are now operational as key communications-routing processors in the Starnet Corp. voice/data network. The switches are connected to seven RCA American earth stations.

International Telephone & Telegraph Co. has named Dr. Charles K. Kao its first ITT executive scientist, a post created to recognize individuals for outstanding scientific contributions. Appointment of an ITT executive scientist is permanent and for a five-year period appointees will be free to work at an ITT laboratory or unit of their choice in areas which are likely to lead to technological breakthroughs. After the five-year period, they will be assigned responsibilities commensurate with their stature and expertise. Kao, a specialist in optical-fiber communications, will help with the planning and management of basic research at ITT and with university research and development programs sponsored and financed by ITT.

General Automation, Inc. has consolidated its worldwide computer business into a single operating unit, the computer group. The move will assure a worldwide orientation in product planning and marketing and improve coordination and communications, according to the group's general manager, Richard Cortese, as well as provide more effective planning and control.

United Telecom Computer Group's United Information Services, Inc. has formed a new business unit, the Professional Services Organization (PSO). PSO will be located in major cities and will focus on consulting, application system design and analysis, custom/contract programming and education and training.

Quantum Corp. has completed an international distribution network that will serve Australia, Denmark, England, Finland, France, West Germany, India, Ireland, Israel, Norway, Scotland, South Africa, Sweden and Switzerland and a repair-depot facility to support the European distributors and customers. The repair-depot facility is located in England and will handle the full range of Quantum disk drive repairs and service.

To T/S Customers

XCS Now Marketing Xerox's 820-II Micro

LOS ANGELES — Xerox Computer Services, Inc. (XCS) has begun marketing Xerox Corp.'s 820-II personal computer to its time-sharing customers.

The linkup allows Xerox's personal computer to communicate with the service bureau's mainframe, serving as an intelligent terminal. The user can run sophisticated manufacturing, distribution and financial systems through the units or disconnect the link and operate it for word processing or spreadsheet applications, XCS said.

Describing the thrust of the program, XCS Vice-President of Marketing Robert Foster said installing the desktop permits an increase in flexi-

bility to the user, offering better price-performance options in delivering XCS' on-line services.

The 820-II can be attached to the XCS network as a single station on a 300, 1,200 or 2,400 bit/sec communications line. XCS said it would also offer the option of linking up three

desktop units to a single 2,400 bit/sec communications line. With this configuration, the 820-II reportedly can simultaneously execute data entry, spooling of reports to the disk and printing of reports from the disk.

XCS is offering the system on both lease and purchase plans.

New Companies

The Harnish Group is a consulting firm providing technical and management services in the development of systems and services using broadcast teletext and videotex. The firm is in Columbus, Ohio.

Police Data Systems has developed turnkey systems for police management information and computer-aided dispatch. Police Data Systems is located at 6500 Dublin Blvd., Dublin, Calif. 94568.

Build your own computer for \$79.95



The Sinclair ZX81 personal computer kit

Imagine building your own computer for only \$79.95!

That's exactly what you can do with the ZX81 kit. It comes with all the parts you need and complete diagrams and instructions for putting it together. All you have to supply is soldering iron, solder, and a screwdriver. Plus, of course, a little bit of work.

But you get a lot more than several hours of kit-building fun. You also get a surprisingly powerful personal computer. The ZX81 hooks up to any TV for a 32-character by 24-line display (we provide the connecting cables). You can also use a standard cassette recorder to store your programs (again, we provide the cables).

Most important, you get a BASIC programming language that's powerful enough to challenge and interest the most experienced programmers. The ZX81 can handle multidimensional strings and numerical arrays. It has full mathematical functions accurate to eight decimal places. Single-key entry for every command. Syntax error detection, debugging codes, and easy editing. Plus features that are ideal for creating games, such as 20 graphic symbols, continuous

display, and random number generator.

The ZX81 can be expanded too. You can increase the memory from 1K to 16K with our Memory Module for \$49.95. And you get a comprehensive manual that completely documents the capabilities of the ZX81, and teaches programming from the ground up.

In short, you get all the features that have made the Sinclair ZX81 the fastest selling personal computer in the world. And you get the satisfaction and fun of building it yourself.

A few years ago, this kind of computer power was simply unavailable to the individual. Even today, most personal computers are too expensive to buy for personal use.

But the ZX81 kit can be yours for only \$79.95. Take advantage of this unique offer today. To order, send the coupon along with a check or money order. Or for faster delivery, call our toll-free number and use your MasterCard or VISA.

To order call toll free: 800-543-3000.

Ask for operator #509. In Ohio call: 800-582-1364; in Canada call: 513-729-4300. Ask for operator #509. Phones open 24 hours a day, 7 days a week. Have your

MasterCard or VISA ready.

These numbers are for orders only. If you just want information, please write: Sinclair Research Ltd., 2 Sinclair Plaza, Nashua, NH 03061.

AD CODE OSC W13	MAIL TO: Sinclair Research Ltd., One Sinclair Plaza, Nashua, NH 03061.		
	PRICE*	QTY.	AMOUNT
ZX81 Kit	\$79.95		
16K Memory Module	\$49.95		
Shipping and Handling	\$4.95		\$4.95
*U.S. dollars	TOTAL		
Name _____			
Address _____			
City _____ State _____ Zip _____			

Sinclair technology is also available in Times/Sinclair computers under a license from Sinclair Research Ltd.

sinclair

Broadmoor Group Investing In Computer Ventures

ST. LOUIS — Venture capitalists are not the only ones infatuated with high technology these days. The Broadmoor Group here, the nation's fifth largest builder of apartment complexes, is prepared to invest "tens of millions" in computer ventures.

Like its venture-capitalist counterparts, Broadmoor is looking for "the next Apple Computer," according to DP consultant Steven Epner, whose consulting company, The User Group, is helping the real estate firm screen venture opportunities.

With the real estate market in a tailspin, Broadmoor's president, Joe Morrissey, is ready to put millions into the computer industry. The company is placing advertisements in various trade journals and *The Wall Street Journal* to locate entrepreneurs.

Epner said Broadmoor hopes to evaluate proposals over the next couple of months and begin investing funds in the near future.

Interested parties can submit a business plan to The User Group, 443 N. New Ballas Road, St. Louis, Mo. 63141.

Now Serves as Chairman

Yourdon Steps Down As President

NEW YORK — Edward Yourdon, president of Yourdon, Inc. for the past eight years, is turning over the presidency of the company to Herbert Morrow, the firm's executive vice-president and marketing director.

Yourdon said he will serve as the firm's chairman, overseeing strategic planning and new product development for the DP consulting, training and publishing firm.

Founded in 1974, the firm currently employs 150 people and has revenues of about \$10 million.

Yourdon said he plans to work on ideas for three books, among them software engineering, the cottage industry movement in DP and computing for children.

In addition, he said he hopes to increase the scope of the company's consulting business over the next couple of years.

Right now the company has a heavy concentration in



Edward Yourdon



Herbert Morrow

training and seminars with emphasis on structured programming and design. However, he said the company

will develop new training programs such as those geared to entry-level personnel.

VAX SOFTWARE!

PACS™ with EZLOG™ is today's standard in:

**Resource Accounting
Performance Monitoring
Internal/External Billing
Project-Based Accounting**



PACS with EZLOG can be yours with a telephone call. Get details now.



Signal Technology, Inc.
5951 Encina Rd. Goleta,
California 93117 (805) 683-3771
Outside California Call Toll Free
(800) 235-5787

VAX is a registered trademark of Digital Equipment Corporation

Mergers & Acquisitions

Systematics, Inc. has reached an agreement in principle to purchase **St. Joseph Systems, Inc.**, of South Bend, Ind., a data processing software firm.

Megnex Corp. of San Jose, Calif. has been purchased by **Ching Fong Investment Co., Ltd.**, of New York.

Omintec Data, Inc. of Phoenix has been acquired by **Heede Industries**, a Greenwich, Conn., investment and management firm.

Burroughs Corp. has acquired **Midwest Systems Group, Inc.**, a specialist in higher education and kindergarten through grade 12 computer programs. The firm will be operated as a division of Burroughs.

Visual Technology, Inc. has reached an agreement in principle with **Caesar's World, Inc.** to acquire **Ontel Corp.** from Caesar's World for an undisclosed amount, subject to approval of the boards of directors of both companies.

Irwin Olivetti, Inc. is a new organization established by a merger between **Irwin International, Inc.**, Ann Arbor, Mich.; and **Olivetti O.P.E.**, Tarrytown, N.Y. **Ing. Olivetti & Co. S.p.A.**, Ivrea, Italy, holds a 35% interest in the firm.

IOF/TSO

Interactive Output Facility

A Comprehensive Approach to Reviewing the Results of JES2 Batch Jobs Under TSO

- ▶ Super-Fast Response Even for Large Jobs
- ▶ Return Code Summary for Each Job
- ▶ Menu Selection of Sysout Data Sets by Step Name and DD Name
- ▶ Split-Screen Operation Under IBM's SPF
- ▶ SPF-Compatible Full-Screen Browse
- ▶ Easy Alteration of Forms, Copies, Etc. After Job Has Run
- ▶ Support for All TSO Terminal Types
- ▶ Support for All versions of JES2



P.O. Box 12752
Research Triangle Park
North Carolina 27709

Triangle Systems, Inc.

919/929-0390

Congratulations!

Perkin-Elmer Corporation

From the Staff and Management of
Gemini Information Systems
for Selecting Our
Data Management and Query System

DDQUERY

for Your Perkin-Elmer Computer System



Where Information Management
Gets Down to Business!
303/773-1905

MINNEAPOLIS

DENVER

TORONTO

TSO GOTCHA DOWN?

We Gotta Solution!

TONE UP YOUR SYSTEM
WITH **TONE 4 MVS**

HYPER - FORMANCE TSO FOR MVS

- No user swapping
- Reduced SRM overhead
- Multiple users per address space
- Full interactive execution capability
- Dynamic allocation support
- No user retraining
- Supports all SPF functions
- SNA/SDLC support
- No permanent system mods
- ACF2 security support
- No need for user switching between Tone and TSO
- World wide sales and support

Over seven years proven experience
in high performance IBM compatible
time sharing systems

TONE
Software Corp.

Call or
Write
for
Details

1735 SO. BROOKHURST ST.
ANAHEIM, CA 92804
PHONE (714) 991-9460
TELEX 181592

STRATUS VS. TANDEM

(Or how the hardware fault tolerant solution supersedes the software based solution.)

"If you drive down the cost of physical hardware, you can make typically redundant paths for less money. Not surprisingly, most redundancy breakthroughs that will occur happen in hardware rather than in software."

You can build a double computer inside one box for less dollars, as opposed to doing it in software, which continually needs maintenance and revision, as well as improvement."

by Aaron Goldberg
of IDC which
appeared in *Computerworld's*
December 28, 1981 issue.

Now that the computer age is in full stride, 100% availability is fast changing from a luxury to a necessity. Downtime and its costs are unacceptable, especially when there is an alternative. Now that fault tolerant operation is becoming a universal requirement, there is demand for an improvement over the software approach used by Tandem. These computers must provide better performance, be easier to use, be easier to program and re-program, be less complicated and less expensive. We believe that the Stratus hardware based fault tolerant system answers these demands. Let us explain.

Why more hardware is better than more software.

The crux of the problem with software based systems is that they require complex, performance stealing software to provide fault tolerant operation. This software robs the system of precious resources because it uses processing cycles to pass status and checkpoint information back and forth between two computers. What's more, this passing of information can occur at four levels: operating system, user program, file management, and terminal control.

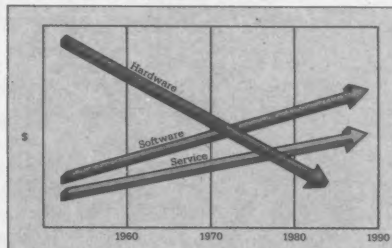
Stratus, meanwhile, has eliminated all this reliability software by having duplicate hardware components tightly coupled, dedicated to performing the same tasks at the same time. It's like having two computers in one, rather than two separate computers. Checking hardware logic detects errors with no performance loss and stops failing components instantly. The duplicate partner continues without interruption, unaffected



STRATUS/32 - SYSTEM HIGHLIGHTS

1. A simple hardware solution to fault tolerance that totally eliminates the need for extra application design and additional programming.
2. A design without performance penalties for fault tolerant operation - NO CHECKPOINTING!
3. A computer that pinpoints and isolates its failures, so repair is made quickly and inexpensively.
4. A system that can expand to 32 Fault Tolerant Processing Modules under a "single system image."

by the failure. This is all transparent to the programmer and the user. With Stratus, there is no performance or data loss when there is a failure, no operator intervention, and no special programming.



While software costs will rise because they are people dependent, experts agree that hardware costs will continue to fall.

Why Stratus is easier to implement.

The Stratus designer and programmer might as well be dealing with a conventional computer; one of them, not two.

Programmers are in a familiar environment. By providing industry standard languages, applications can be moved over without redesign or major re-programming. Fault tolerant operation is a bonus, not a complex effort.

Since there is no checkpointing with the Stratus hardware based solution, the applications designer and programmer is never concerned about overhead for fault tolerant operation. They view the system as a single computer; unconcerned that there are two computers running together.

\$130,000 - Software included.

The Stratus concept could not have been executed 10 years ago, 5 years ago, or even 2 years ago. It is possible now because of the dramatic price drop of hardware components. Because of this lower cost of hardware, and because of the simplicity of its architecture, Stratus can offer Continuous Processing™ at a price competitive with traditional systems that don't offer this capability. A fully duplexed configuration with 2 megabytes of memory, peripherals, and software can be purchased for under \$130,000.

Don't overlook our software.

To complement our hardware approach to Continuous Processing we have an impressive list of software. For instance: Virtual Operating System (VOS), Transaction Processing System (TranPro), Data Management System, CRT oriented command language, Cobol, Basic, PL/I, Fortran, Pascal, Networking using X.25, IBM Communications, full screen editor, symbolic debugger, forms designer and a complete Word Processing package.

If your application requires total reliability, if you are considering any kind of dual-processor configuration or if you're considering Tandem, then you should fill out our coupon or call Nick Bologna, Director of Product Marketing, 617/653-1466.

Stratus Computer, Inc. CWA
17 Strathmore Road, Natick, MA 01760

Name _____
Title _____
Company _____
Type of Business _____ F. one _____
Address _____
City _____ State _____ Zip _____

Stratus
CONTINUOUS PROCESSING™

South Africa Experiences Explosion in DP

By Bohdan O. Szuprowicz
Special to CW

While industrialized economies of the northern hemisphere continue to stagnate and even their computer industries have begun to show slower growth again, South Africa is experiencing a DP business explosion unprecedented in its history or in many other countries of the world.

The South African computer industry as a whole has been growing at 40% per year — almost exactly as fast as predicted by the country's industry observers at the outset of the 1980s. This explosive growth comes on top of a very healthy average 25% annual expansion that the South African computer industry experienced during the 1970s and which developed the basis for current growth in demand for hardware, software and services.

IBM South Africa, which is believed to control about 30% of the market, claims to be doing even better than the industry as a whole. According to Tony Dry, IBM South Africa's new marketing director, the company experienced a growth rate of almost 80% during 1981 and its software sales have been increasing at 50% annually.

Profitable Subsidiary

Although IBM does not release any sales figures for its foreign subsidiaries, industry observers estimate that IBM South Africa sales are currently about \$200 million annually. This would also make the company one of the most profitable IBM subsidiaries, bringing in about \$111,000 for each of its 1,800 employees in South Africa.

While IBM South Africa had always been the leading industry supplier in terms of value of installations and gross revenues, it was challenged during the 1970s by the UK-based ICL, a company that claimed more computer systems installed through most of the last decade.

Last year, however, ICL

slipped to third place and was overtaken by Burroughs Corp., which almost matched IBM South Africa in overall sales during 1980.

No doubt such a close call by Burroughs, which is IBM's major American hardware competitor in many parts of the world, must have given IBM South Africa the additional impetus that resulted in its remarkable sales performance during 1981.

Since Burroughs does not have a market share comparable to IBM in any other country, this fierce competition is likely to continue for many years.

Top Hardware Supplier

ICL, nevertheless, remains a leading computer hardware supplier in South Africa, and that market is important to the British computer manufacturer. ICL is estimated

to derive about 10% of its global sales and about 25% of its non-UK sales from South Africa.

Among all the major mainframe suppliers operating in South Africa today, ICL is believed to be the most likely to establish a computer manufacturing plant in the country, perhaps in the very near future.

Besides the above-mentioned computer suppliers,

other manufacturers that already have a market share include NCR Corp., Sperry Univac, Control Data Corp., Hewlett-Packard Co., Digital Equipment Corp., Data General Corp. and Siemens AG.

None of the above controls more than a few percentage points of the overall market, and all are in a very competitive situation resulting from a proliferation of small and microcomputer systems

SOME OF AMERICA'S TOP TOOK A CLOSE LOOK AT OUR

ABBOTT LABORATORIES
ATCHISON TOPEKA AND SANTA FE
AT&T
BANKERS LIFE COMPANY, INC.
CITICORP
CONSOLIDATED FREIGHTWAYS
FEDERAL EXPRESS
FIRST NATIONAL BANK OF ATLANTA
FMC CORP.
GENERAL MOTORS
HOLIDAY INNS, INC.
LTV CORP.



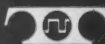
THE TELETYPE 4540 FAMILY

Directory Lists Service Vendors

MOUNTAIN VIEW, Calif.
— The 1982 Directory of Leading U.S. Computer Services Vendors has been published by Input, Inc.

The directory surveys the activities of 243 U.S. firms with computer-services revenues greater than \$10 million. Companies are classified as either DP, software products, professional services or integrated systems vendors.

The book costs \$2,000 from Input, 1943 Landings Drive, Mountain View, Calif. 94043.



Teletype Corporation, 5555 Touhy Ave., Dept. 3223-F, Skokie, IL 60077. Tel. (312) 982-2000.
"Teletype" is a registered trademark and service mark of Teletype Corporation.

With IBM at Forefront, Burroughs Trailing

firms and their representatives or agencies. It seems that given the dire need for programming and systems capabilities, the hardware suppliers who can best provide a solution to that problem will be rewarded with a growing market share in the future.

Ominous Entrant

The latest, and potentially most ominous entrant, how-

ever, is Japan, with large-scale, IBM-compatible systems offered through an agency and several personal computer products being readied for entry into the South African market. Japan has a vested interest in developing the best trade climate with South Africa because of its extensive dependence on strategic and critical minerals, many of which are imported in large

quantities from South Africa.

One of the probable reasons for the present computer hardware sales explosion in South Africa may be the Reagan administration's decision in March 1982 to relax the four-year embargo on computer hardware and software sales to South African police and armed forces, which protested apartheid policies and supported American human rights poli-

cies stressed under the Carter administration.

Under New Rules

Under the new rules, sophisticated computer systems may be granted licenses for export to South Africa's rapidly growing military-industrial complex that includes Armscor, the 10th largest weapons manufacturing organization in the world. Chances are that IBM

South Africa, with its superb corporate intelligence, anticipated the embargo relaxation and was well-poised to enter the lucrative markets for large-scale equipment that have grown during the embargo years.

No doubt the same reasons account for Burroughs' extraordinary performance in South Africa; Burroughs also supplies many large-scale sophisticated systems suitable for weapons and systems control.

Personal computers, word processors and small business computers do not require U.S. export licenses, no matter what their destination in South Africa. As a result, this market, which is also growing very fast and offering equipment that is particularly suitable to the small South African firms, will probably be very profitable for the early entrants.

Growing Unrest

On the other hand, there is growing unrest within South Africa as a result of increasing trade union activity, the slumping price of gold, inflationary pressures in the economy and the unresolved question of Namibia. On top of these national problems, the desperate shortage of skilled programming and computer operating personnel is somewhat of a paradox. Social changes designed to bring a much larger proportion of the black population into skilled and supervisory positions in the economy are being developed, but are unlikely to keep pace with the demand in the computer industry — at least for the next 10 or even 20 years.

The South Africans see an accelerated introduction of automation and computers as part of their long-range solution, but this creates immediate demands for DP-skilled personnel that are not available in South Africa.

CORPORATIONS CRTs.

METROPOLITAN LIFE INSURANCE CO.
PAINE WEBBER, INC.
UNITED STATES STEEL
WARNER COMMUNICATIONS, INC.

AND BOUGHT.

It's time you took a close look, too. You'll soon discover the value that made an impressive list of customers buy over 200,000 CRTs from Teletype Corporation.

Take our microprocessor-based 4540 terminal. This cost-effective 3270 compatible system now offers local connect, in addition to clustered and single display workstations, for applications involving inquiry response, data entry and retrieval.

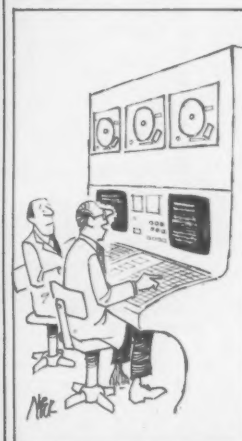
Human engineering exemplifies the 4540's value with features like conveniently located controls; tactile feedback; adjustable keyboards; crisp character presentation; smudge-resistant, etched glass; and a non-glare, tilt screen.

To minimize downtime, built-in self-diagnostics help you locate problems before they become bigger problems. And modular design permits easy component replacement to speed repairs.

These product features, coupled with a strong service organization and readily available inventories, enhance the 4540's overall value.

So take a closer look. We want you on our screen, too.

TELETYPE®: VALUE SETS US APART.



'They Don't Write Programs Like That Anymore.'

SNA/SDLC to ASCII INTERFACED WITH PROTOCOL'S 1067 & 1076 CONVERTERS

Finally!...TSO dial in support from
inexpensive ASCII terminals and printers!

Full screen support on CICS, IMS, NCCF, NPDA. Direct or dial in from anywhere in the world at any time. All from a portable ASCII device or microcomputer. Call Newcorp Products now, toll free, for a hardware solution to your protocol problems!

SALES • RENTALS • SERVICE

Call 800-345-8278

In Pennsylvania (215) 485-8180

In Canada (416) 494-3600

Newcorp Products, Inc. is the authorized U.S. and Canadian service center for Protocol Computers, Inc.

**Newcorp
Products, Inc.**

45 Commerce Drive • Aston, PA 19014

U.S. Service Firms Abroad Not Seen Till Decade's End

WASHINGTON, D.C. — The federal government is increasingly supporting U.S. service industries, including DP and telecommunications, in its efforts to ease business restrictions abroad, but a recent congressional report states that multilateral services/trade negotiations will not bear fruit before 1990.

Various services sectors, particularly telecommunications, information and insurance, have petitioned the administration and Congress for help in fighting barriers to their international operations. There are numerous bills pending in Congress for that purpose, and the executive branch has given services/trade

problems high priority.

A new report from the General Accounting Office (GAO), which primarily addresses the insurance industry but which also comments on services trade in general, notes these developments and also pointed to apparently successful U.S. government efforts to raise these services issues within the framework of the General Agreement on Tariffs and Trade and within the Organization for Economic Cooperation and Development.

The GAO agreed "nations are now starting to view barriers to international services trade as an important issue" and that "there is a very good prospect that a services round of multilateral trade negotiations will be undertaken." But, the report said, "negotiations will not likely begin before the mid-1980s nor be completed before the end of this decade."

The Art And Science of Better Communications.

BRILLIANT COLOR AND BUSINESS GRAPHICS FOR THE 3270 USER.

Color is defined as that visual perception that lets you distinguish between seemingly identical shapes. When those shapes appear as data on a CRT, color can help identify, organize, emphasize and format. How you differentiate between today's color terminals, however, goes beyond visual perception to a weighing of other practical business benefits. Compatibility. Comfort. Cost. Operational ease. Versatility. The quality of the color and of the overall product. All benefits available now and detailed below.

Product Set: Memorex® 2079 Display Stations; Models S2A, S2B, S3G, 2X and 3X.

System Interfaces: IBM 360, 370, 303X, 308X, 433X and 8100.

Compatibility: IBM 327X plug compatible; Bisynchronous; SNA/SDLC.

Product Specifics: On 2079 Color, Convenience And Comfort. All 2079 models deliver bright, crisp color—color that can be brought up quickly, normally with no special software or controller modifications. Pre-converged color eliminates time consuming manual color alignment. And a host of features further contribute to operator convenience and comfort—like a tilting and removable monitor, a detachable, low-profile keyboard, a recessed sun-flex screen and non-glare keytops and surfaces to reduce eye strain.

On 2079 Versatility And Powerful 2079 Graphics. Five 2079 models, three in standard off-the-shelf configurations and two that can be user-configured, give you maximum versatility and cost efficiency. And with graphics available on both a standard and a configurable model, you can put color to work in dozens of business graphics formats.

On Top-Of-The-Line 2079 Quality And Bottom-Line 2079 Cost Efficiency. The 2079s are designed for economy. They need less power and generate less heat than the IBM counterparts. And thanks to their compact design, they take up less space. But basic Memorex quality is really the best economy—economy that results in more productive and longer lasting operation.

Memorex. The Communications Group. For more information, contact Laurie Schuler at 18922 Forge Drive, Cupertino, CA 95014-0784. Or call toll free to (800) 538-9303. In California, call (408) 996-9000, Ext. 222.



MEMOREX

A Burroughs Company

Contracts & Pacts

Raytheon Data Systems Co. has received initial funding under a \$26.4 million contract from the Environmental Protection Agency (EPA) to supply and service up to 2,500 word processor units to be installed at central EPA facilities in Washington D.C., and regional and field offices throughout the U.S.

Science Management Corp.'s Information Systems Division has been awarded a contract to provide general systems and programming support to federal agencies in the Washington, D.C., area. The firm has also received a contract from the U.S. Army to perform a materials system analysis. The contracts have a total value of \$8 million to \$11 million.

Hallmark Business Systems, Inc. has signed a three-year, \$20 million contract with Honeywell, Inc. to market their DPS 6 minicomputers throughout the U.S.

Racal-Milgo Government Systems, Inc. has received a \$6.5 million contract from Electronics Data Systems Corp. (EDS) for modems that will be included in EDS' Viable system for the U.S. Army.

Generation Sciences, Inc. has received orders totaling nearly \$300,000 from the U.S. Army for three installations of Genasys software and support services.

Commterm, Inc. has signed an OEM agreement to supply Anaconda-Ericsson's Communications Division with voice-store-and-forward systems for integration with Anaconda-Ericsson private automatic branch exchange.

Cipher Data Products, Inc. will provide Sperry Univac with several thousand Microstreamer ½-in. streaming tape drives over the next five years under a contract valued in excess of \$12 million.

Does Your Company Produce Catalogs?

We'll Cut The Size, Weight, Delivery Time and Cost!

*Catalog Produced by Conventional
Printer (the old way)*

*Same Catalog Published by
O'Neil Data Systems*

*600 Page Catalog, Weight: 3 lbs.
Delivery time: 2 to 3 Weeks*

*275 Page Catalog, Weight: 1 lb.
Delivery Time: 4 Days*

IF YOUR COMPANY PRODUCES PRICE CATALOGS, inventory lists, parts manuals, schedules, internal telephone directories, library catalogs, reference and instruction material, membership or registration lists, we can save you substantial money and delivery time.

If you have large numbers of items in a computer you need to print and distribute on a recurring basis, **JUST SEND US A MAGNETIC TAPE AND WE'LL DO THE REST:**

- Innovative catalog redesign and data organization. Reduction of weight, space and number of pages. Format changes and error corrections. Automated printing and fast mailing to your distributors or mailing lists. In the example above, \$1.71 per book is saved alone on 1st Class Postage between Los Angeles and Chicago.
- Your product will look better and be easier to use. You'll save even more money because our shorter delivery time gets price changes to your dealers faster. (Time means Big Money during inflationary periods.)
- You will avoid delays and headaches related to internal priority and approval problems when you want to make changes to your catalog. Changes that require your computer staff to alter their programs. We have 12 Systems Programmers and make such changes in a few hours.

- O'Neil Data Systems has two large scale computers driving Advanced Computer Output Microfilm and Phototypesetting equipment plus our own automated printing facility; all on the premises. We don't ship out or subcontract any phase of your job. This means we do your job faster and at less cost to you.

• WHOSE CATALOGS DO WE PUBLISH?

Beckman Instruments, Inc.	Pacific Telephone and Telegraph
BMW Motor Co. North America	Peterbilt Motors Company
Burroughs Corporation	Real Estate Digest
Computer Sciences Corporation	San Diego Unified Schools
Walt Disney Productions	The Service Bureau Co. (Control Data)
Fiat Motors of North America	Telecredit, Inc.
Foremost McKesson, Inc.	Toyota Motor Sales, U.S.A., Inc.
General Dynamics, Convair Div.	United Stationers
American Honda Motors Co., Inc.	University of California
Kahan & Lessin Co.	U.S. Suzuki Motor Corporation
Kawasaki Motors Corp., U.S.A.	Volkswagen-Porsche-Audi
NASA/AMES	Volvo of America Corporation
Department of the Navy	Yamaha Parts Distributors, Inc.

WHY NOT LET US BID ON YOUR NEXT PRINTING CONTRACT?

Tell me more about saving money and time with your **Faster 4-Day Service.**

Name _____
Title _____
Company _____
Address _____
City _____
State _____ Zip _____
Phone _____

O'NEIL DATA SYSTEMS, INC.

2005 Armacost Avenue • Los Angeles, California 90025 • Telephone: 1/213/820-4247

JUST SEND US A MAGNETIC TAPE — WE DO THE REST!

Nickels & Dimes

AT&T will sell eight million common shares at \$57.18 per share to a group of dealers including Morgan Stanley & Co., Inc.; The First Boston Corp.; Goldman, Sachs & Co.; Merrill Lynch White Weld Capital Markets Group (Merrill Lynch, Pierce, Fenner & Smith, Inc.); and Salomon Brothers, Inc. The purchasers will offer the shares to the public. AT&T plans to use the proceeds from the sale for advances to subsidiary and associated companies, for additional equity investment in the companies and for general corporate purposes.

\$\$\$

Apollo Computer, Inc. has completed its fourth round of financing, a privately placed offering of \$5,000,000. The funds will be used

for working capital, according to a company spokesman.

\$\$\$

Atlantic Research Corp. has completed an offering of 495,000 shares of common stock at \$23.25 per share. Proceeds will be used to repay a portion of the company's revolving credit loan.

\$\$\$

Corvus Systems, Inc. has filed a registration statement with the Securities and Exchange Commission for a public offering of 1,800,000 shares of common stock, 1,300,000 being sold by the company and 500,000 by certain shareholders. Dean Whittier Reynolds, Inc. and Montgomery Securities have been named as managers of the underwriting group that

plans to offer the shares to the public in late September. Net proceeds will be used by the company for repayment of bank debt, capital expenditures and working capital.

\$\$\$

The Prudential Insurance Company of America has reached an agreement in principle with the Southern Pacific Co. to provide a substantial part of the funding for Southern Pacific's communications satellite program. Prudential will invest up to \$135 million over a three-year period.

\$\$\$

Micropolis Corp. has received \$6.6 million in equity from venture capital sources and a \$10 million revolving long-term line of credit with the

company's principal bank. Names of the investors were not disclosed. The funds will be used for the introduction of new products in 1982.

\$\$\$

Lundy Electronics & Systems, Inc. plans to file a registration statement for the offering of approximately 500,000 units of common stock and common stock purchase warrants. Proceeds will be used for additional research and development, equipment and working capital.

Orders & Installations

Honeywell, Inc. has received orders from Jackson National Life Insurance Co. and Middle Tennessee State University for Dual DPS 8/44 systems. The total value of the contracts is \$2.5 million.

Sperry Univac has received orders for its System 80 computers from the city of Cambridge, Mass.; the New Jersey Highway Authority; Meltronics, Inc.; Brand Names Sales, Inc.; Metro Computing, Inc.; Delair/Public Leasing; and Cow and Gate, Ltd., a British baby food manufacturer.

On-Line Business Systems, Inc.'s Software Products Division has received an order for its Wylbur systems from Textronix, Inc. The contract is valued at more than \$100,000.

RCA Service Co. will provide continued on-site maintenance for American Airlines Sabre system data communications equipment under the terms of a contract valued in excess of \$6 million annually.

Datacrown, Inc. will supply computing services and technical support to the National Association of Securities Dealers, Inc. Value of the 18-month contract was not disclosed.

Icot Corp. has received a \$2.5 million order from American Airlines for intelligent terminals and associated data communications equipment.

IDC Launches Micro Service

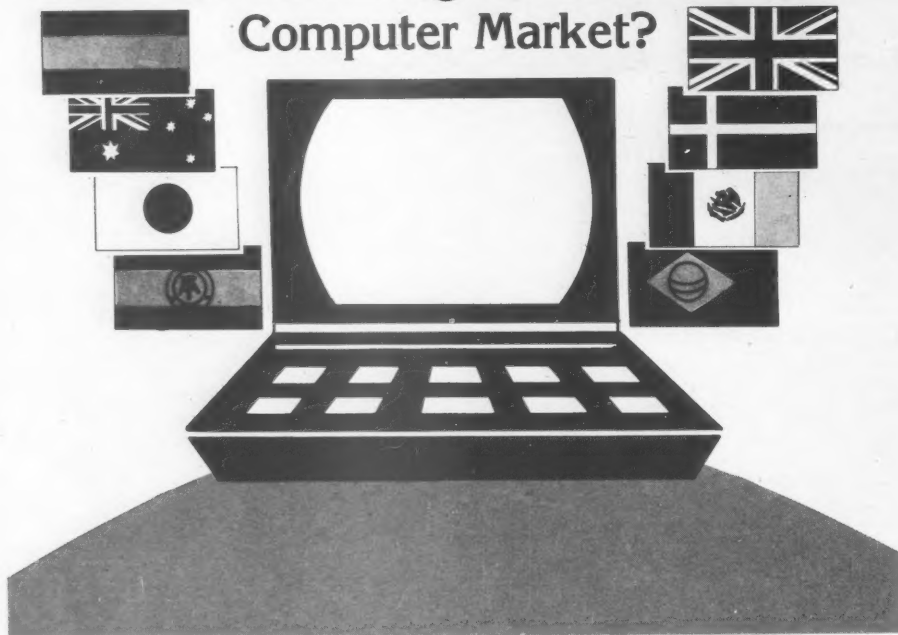
FRAMINGHAM, Mass. — International Data Corp. (IDC) has launched the Micro Systems Marketing Service aimed at micro vendors.

The first product of the service is a report called "Channels of Distribution," which analyzes distribution trends and strategies among vendors and resellers in the micro market.

Other components of "Channels of Distribution" include bulletins, a monthly newsletter, annual census and 5-year forecast of the Desktop Computer Market and complimentary attendance at IDC's 2-day conference in Napa, Calif.

A charter subscription to the report — including a year's worth of related components — costs \$9,000 from IDC at 5 Speen St., Framingham, Mass. 01701.

Are You Reaching the International Computer Market?



We can put you in touch with the right people in the major computer markets throughout the world. The people who make the buying decisions — in countries importing a total of well over \$3 billion a year in computer hardware, software and supplies.

As the world's largest publisher of computer-related newspapers and magazines, we own and represent the leading local computer publications in the world's major computer markets — markets that account for the vast majority of all computers in use today (measured by value).

Our International Marketing Services will give you one-stop advertising service for any or all of these publications — including translation and production services. We'll even bill you in dollars, so it's as easy as advertising in your local publications.

In addition, we can help you with market facts, and, in the case of The People's Republic of China, we offer special seminars. For further information send in the coupon indicating your area of interest, or call Diana La Muraglia at (617) 879-0700.

We publish or co-publish in:

Australasia
W. Germany
People's Republic of China
United Kingdom
Japan

Mexico
France
Spain
Denmark
Brazil

We provide U.S. advertising representation and editorial services to publications in the following countries:

Greece
The Netherlands
Argentina
Chile
Southeast Asia

Kuwait
Sweden
South Africa
Italy

Diana La Muraglia
Manager, International Marketing Services
CW Communications, Inc.
375 Cochituate Road, Framingham, MA 01701 U.S.A.
(617) 879-0700

Please send me rate cards and information on publications in the following countries:

☐ I am interested in more details on your seminars on The People's Republic of China.


Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

 **CW COMMUNICATIONS/INC.**

POSITION ANNOUNCEMENTS

STATE-OF-THE-ART JOB OPPORTUNITIES

SR. DATABASE SPECIALIST to \$38K
TOTAL, RAMIS, Database and model development in highly stable environment.

DATA CENTER MANAGER to \$34K
HP-3000. Excellent upward mobility potential.

SR. PROGRAMMER/ANALYST to \$35K
DOS, VSE, CICS, 4341 on order. Rapidly growing company.

SYSTEMS PROGRAMMER to \$40K
MVS, CICS. Function as team leader. Strong background in capacity planning and systems architecture.

SYSTEMS ANALYST ... to \$35K
Act as inhouse consultant for conversion to IBM system. CICS exposure preferred. Excellent opportunity to help design system from ground up.

PROJECT LEADER ... to \$36K
4341, OS/MVS. Supervision of maintenance and major enhancements with eventual design responsibilities.

PROGRAMMER/ANALYST to \$32K
TANDEM applications (COBOL) for EFTS system. High visibility position.

Employer retained agency, call or send resume to:

COMPU SEARCH

50 CALIFORNIA STREET
SUITE 3550-A
SAN FRANCISCO, CA 94111
(415) 382-0911

OPPORTUNITIES IN ATLANTA!

Digital Communications Associates, Inc., a rapidly growing company in the data communications industry, has openings in the Engineering Department for System Software Programmers. These positions involve the design and implementation of data communications software for DCA's microprocessor-based network processors.

Three to six years experience in real-time assembly language programming are required for these positions. Microprocessor and data communications experience is a plus.

If you have the appropriate experience and would like to explore this opportunity further, either call or write:

Bill Posay

dca

Digital Communications Associates, Inc.
303 Technology Park, Norcross, Georgia 30092
404/448-1400

An Equal Opportunity Employer M/F

MANAGEMENT INFORMATION SYSTEM PROFESSIONALS

A UNIQUE
ENVIRONMENT
FOR ACHIEVEMENT

C F Braun & Co is a world leader in the petrochemical engineering and construction industry. We have immediate openings in our Engineering Development Center at our Alhambra, California, corporate headquarters. These positions offer a high degree of challenge, high visibility and excellent potential for career development.

At Braun, you will be an integral part of a development team that will formulate integrated on-line data base applications required to support our engineering, project controls and business activities around the world. We are at the beginning of a long-range system development effort to create innovative solutions to organizational needs. This unique situation provides individuals the opportunity to work closely with various components of our business to conceptualize, plan, design and implement a new generation of computer systems.

Join our team of professionals in helping us meet the management information challenges of tomorrow by considering one of the following positions in our Engineering Development Center.

Data Base Analyst

Duties include providing expert knowledge of data base systems during the design of integrated applications and translating system specifications into integrated data base systems. Responsible for reviewing existing systems and future requirements to maintain as well as improve system performance of data base applications. Responsible for data reliability, integration and standardization. Requires a bachelor's degree in Computer Science or closely related field and a minimum 5 years experience in computer development field with emphasis on data base systems development and design.

Engineering Design Analyst

Responsible for defining integrated on-line systems for engineering design applications with data base systems and providing expert technical assistance in the planning stages of development projects. Consults with users, customers, vendors and Computer Systems staff to specify requirements for graphic systems. Requires a bachelor's degree in Computer Science or closely related field and 7 years experience in the computer development field with emphasis on integrated on-line engineering systems.

Communications Analyst

Position duties include conducting logical analysis of communication requirements and configurations for new system development projects and translating computer configurations into purchase specifications. Responsible for providing technical direction to Computer Systems staff, developing standards for utilization of communication networks and monitoring network performance. Requires a bachelor's degree in Computer Science or closely related field and 7 years experience in the computer development field with emphasis on computer systems communications configuration.

Computer Systems Planner

Position is responsible for developing and translating company-wide systems development specifications into computer systems configurations. Involves working closely with systems development staff and computer vendors to ensure that specified performance characteristics are achieved. Duties also include determining the cost effectiveness of present and proposed future computer system configurations. BS degree in Computer Science or a related field with 7 to 12 years computer systems experience is required. Experience should include 3 to 5 years in systems hardware and software planning. MS degree preferred.

System Design Planning and Analysis

Positions are responsible for providing definition and formulation of solutions to a wide variety of business issues. Responsible for translating solutions into specifications for integrated on-line data base systems. Will survey, define, specify and develop automated systems to support Braun's international engineering and construction organization at all levels of management. Must have recognized skills to conceptualize, design, manage and implement development tasks. Experienced individuals must have skills in the following areas in developing management information systems:

- **Project Controls**
Heavy emphasis in scheduling, material control, cost engineering, estimating and quality control.
- **Engineering Systems**
Experienced in problem solving activities necessary to support the following engineering disciplines: civil, mechanical, piping, electrical, instrumentation, chemical and process.
- **Business Systems**
Areas of involvement include time distribution, project accounting, manpower projections, workload forecasts and general business.
- **Field Systems**
Understanding of field site procurement, inventory control, receiving, inspection, scheduling and construction activities.

Senior Systems Design Planners

BS degree in Business Administration, Engineering or Computer Science with a minimum of 8 years combined experience in computer systems and related discipline.

Design Analysts

BS degree in Engineering, Business or Computer Science with a minimum of 3 years experience in designing integrated on-line data base systems.

REASONS TO JOIN THE BRAUN TEAM

We offer excellent salaries along with an attractive benefits program. This program includes life, medical, dental and accident insurance, commuter van service, a two-way retirement plan, profit sharing, investment savings plan and more. At Braun, our standard workweek is 4½ days with Friday afternoon off.

Send your resume to:

Bob Owiecki
Department CW 0913
1000 S. Fremont Avenue
Alhambra, CA 91802

Equal Opportunity Employer

BRAUN
C F BRAUN & CO
A SUBSIDIARY OF SANTA FE INTERNATIONAL CORPORATION

Computer Professionals With
Two or More Year's Experience:

Learn About New Opportunities and Where You Might Fit In...



At Source Edp's Computer Career Conference. \$18,000-\$54,000+

Call Mike Parr at 1-800-821-7700 x331.

Do you really know if you're in the one best position? Or are there other opportunities that will provide state-of-the-art exposure, more compensation and maximum potential for long-term growth?

The Source Edp Computer Career Conference will help computer professionals evaluate the current job market, find out where they stand and stay in touch with today's dynamic computer field—all in complete confidence. Key information systems executives in your area and across North America will be available throughout the Conference—at your convenience—to explain their long-range plans and where you might fit in.

Over 9,300 New and Exciting Positions.

Firms participating in the Conference represent a broad cross section of user, consulting and service organizations. They are diverse in industry concentration, size and location. Many types of positions are available, and compensation levels are outstanding.

In all, over 9,300 specific positions exist. The Conference offers you a very convenient and productive method of investigating a wide variety of career options—all in complete confidence. There are no forms to fill out—nor is a resume necessary. You will meet only those firms that you are interested in—or that have interest in you. Discussions will be held in strict privacy. There are no fees or forms to fill out. Nor is a resume necessary.

Following is a summary of the kinds of positions and compensation offered.

Applications Programming—\$18-\$45,000.

Those with two or more year's experience in applications programming will have an opportunity to learn new skills and earn maximum compensation. Positions exist in environments ranging from the largest scale mainframes through mini/micro-computer technology and across virtually all computer manufacturer products. This involves a variety of languages including COBOL, PL/1, Assembly, RPG II, or BASIC; operating systems like OS/MVS, DOS/VS, VM; and data base and data communications like IMS, CICS, TOTAL, IDMS, ADABAS, System 2000, ENVIRON I and more. Significant opportunities exist for those with solid programming backgrounds to move into systems development, software, EDP auditing or systems evaluation.

Systems Development, Consulting, Project Management, EDP Auditing—\$25-\$54,000.

Many openings exist for persons with systems development or audit backgrounds ranging from Junior Analyst to Senior Project Manager. Experience in manufacturing, finance and/or distribution information systems is particularly valuable. A number of organizations participating in the Conference will offer current Applications Programmer Analysts the opportunity to move directly into systems design projects. Those more senior are sought for Project Manager openings. Many larger organizations who are now planning ambitious expansion programs will provide formal management training and development. Several smaller or intermediate size firms now making their initial thrust into computing—especially in mini/micro areas—are seeking persons to help them develop and oversee new systems technology.

Systems Programming, Software Development, Data Base Systems, Telecommunications, Technical Writing—\$24-\$52,000.

Those with several years of systems software, data base or telecommunications experience will be able to gain exposure to some or all of the following: OS, VS, MVS, JES3, CICS, IMS, TSO, DL/1, BTAM, TCAM, VTAM, OCR, duplex lines, modems, programmable line concentrators, switches, CRT's, IBM up to 370/168's, 4341-2's and 3033's, and a variety of non-IBM systems including most types of mini-computers. Assignments range from development and modification to maintenance, support and technical documentation of advanced data base and data communications software, graphics, CAD/CAM and distributed processing. Many firms offer formal training and day-to-day contact with some of the top technical professionals in the country. There are senior software positions available as well as entry-level software positions for Applications Programmers who are strong in OS/BAL.

Marketing—\$30-\$90,000. Marketing Support—\$22-\$42,000.

Those professionals who attend the Conference will learn about new opportunities in computer marketing and marketing support. Many alternatives exist in many product areas including mainframes, mini/microcomputer technology, terminal systems, time-sharing, facilities management, proprietary software packages, OEM's, consulting and more. Many firms are just now entering new markets and will provide exceptional career and compensation growth potential.

How to Participate.


The Computer Career Conference is scheduled in a city near you soon. There is absolutely no charge for your involvement or attendance since client companies who will participate will assume all fees.

Simply call Mike Parr today at 1-800-821-7700 x 331. (Those in Hawaii or Alaska, call 1-800-821-3777 x 331). Our lines are open everyday, twenty-four hours. Once we hear from you, one of our professional staff will get back to you about Conference dates in your area.

Call, in Confidence, Anytime Day or Night 1-800-821-7700 x 331.

If you're unable to call, write:

Mike Parr
Career Conference Director
Source Edp Headquarters
Two Northfield Plaza
Suite 227, Dept. C4
Northfield, Illinois 60093

source  **edp**

North America's largest recruiting firm that specializes exclusively in the computer profession. Client organizations assume our charges.

position announcements

position announcements

Technical Employment Open House...for MicroPro™

Home of the famous family of microcomputer software packages, including WordStar...the #1 selling multilingual word processing software in the world.

You are invited to interview with our R&D managers at your choice of two locations. Come visit us at the Sunnyvale Sheraton...or at our corporate headquarters in Marin County, just 20 miles north of San Francisco.

SUNNYVALE

The Sunnyvale Sheraton
1100 No. Mathilda Avenue
Sunnyvale, CA 94086

Tuesday, September 21st, 5:30 p.m. to 8:30 p.m.

MARIN COUNTY

MicroPro's Corporate Headquarters
33 San Pablo Avenue
San Rafael, CA 94903

Saturday, September 25th, 10:00 a.m. to 1:00 p.m.

The following newly created positions are available at our corporate headquarters in Marin County:

Senior Programmers

Design, enhance and develop business applications software for microcomputers. BSCS or equiv. plus exp. in CP/M, 808X, Assembly, C or PASCAL. Four plus yrs. programming exp. desired.

Team Leader/ Development Technology

Head up a product configuration team and work closely with equipment manufacturers in configuring software packages for pre-production released computers. Six yrs. programming plus some supervisory exp. desired.

Project Manager/ Text Processing

Be responsible for new product specs and follow-through coding. Word processing development, graphics and microcomputer background essential. Ten yrs. programming, including 2 plus yrs. project management exp. desired.

Team Leader/ Data Management

Supervise small programming staff with responsibility for maintenance of DataStar™ and InfoStar™ Six plus yrs. exp. desired.

Stop by our Open House at the location most convenient to you. If you prefer, call (415) 499-1200, ext. 2184 to pre-register. If unable to attend our Open House, please forward your resume to MicroPro International Corporation, 33 San Pablo Avenue, San Rafael, CA 94903. An equal opportunity employer.

MicroPro™
INTERNATIONAL CORPORATION

Creator of **WordStar®**



EDP OPPORTUNITIES COAST TO COAST

Robert Hall, staffed by EDP professionals for EDP professionals with 50 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1966 also makes Robert Hall the oldest. One call and you can search the local, national and international markets. All fees are paid by client companies, of course. The following is a partial listing of opportunities and locations:

CHICAGO

Chicago Is Your Kind Of
Team...

PROGRAM ANALYST

This company is on the move with soaring profits! There is plenty of room for advancement so get in on the ground floor. Your 2+ years of BASIC experience will enable you to work hand in hand with the Chief Financial Officer developing the micros throughout the corporation. Heavy user interface. **\$25,000**

PROGRAMMER ANALYST

Meet your future! Challenging assignments working with securities, stocks, bonds. Your strong BAL or Assembler will put you on this team. 60% analyst. CICS and some COBOL required. **\$35,000**

On State Street
That Great Street...

SYSTEMS ANALYST

Put your talent to work for this internationally recognized giant. Utilizing the latest hrde and DB techniques you will find your working hours flying by. CS, eng or math degree and 4+ years experience with PL1, PASCAL, COBOL, and DB will put you in charge of a team supporting their new and existing product lines. **\$40,000**

DP MANAGER

If you have the desire to be heard this is the chance you've been waiting for. 3+ years on PDP11/70 using BASIC+ and RSTS with a strong business background qualifies you to evaluate and upgrade hardware and software. This company is aggressive and open to new ideas. Light travel. **\$28,000**

Each Time I Room Chicago
Is Calling Me Home...

SYSTEMS ANALYST

CAD/CAM specialist. You are needed right now! This company is exploding with business. Requirements: STRONG Assembler, Fortran, MVS operating system, masters in CS. You'll be working with the greatest scientific minds of our times. **\$40,000**

PROGRAMMER ANALYST

Keep abreast of the technical developments in this manufacturing environment. Background should include COBOL 1+ yrs CICS, IDMS or IMS, DL1. You'll be working on MRP shop floor, production control. Career climbing opportunity! **\$27,000**

Chicago, Chicago
We'll Show You Around.

PROGRAMMER ANALYSTS

5+ years BAL (DOS) Financial applications.
3+ years BAL (OS) Banking applications.
2+ years COBOL and PL1 IMS DBDC Trust applications.
3+ years Fortran - Heavy statistical involvement. **\$30,000**

Your abilities and
our contacts
can take you a long way.

Sandy White
ROBERT HALF
of Chicago, Inc.
35 E. Wacker
Chicago, IL 60601
(312) 782-6930

HARTFORD

IMS

CT apply for IMS trained indiv's currently in prog/analyst or sys analyst responds to move into tech support function in expanding data ctr. **\$32,000**

SYSTEMS PROG

Nat Blue Chip corp seeking indiv with IBM/MVS tech bkgd to install all future IBM software prod. **\$36,000**

DATA BASE

IMS bus devel exp qualifies for mgmt oppty in directing small tech., & devel staff. Ind bkgd open. Cent CT loc. **\$40,000**

SYS MANAGER

Current exp in direct online fin'l apps using CICS qualifies for CT oppty in state-of-the-art. Client exp rapid growth. **\$40,000**

TELE-COMM

CT based client seeks IBM TCAM/VTAM indiv's for expanding nat-wide network. Oppty for microwave, satellite transmission studies. **\$36,000**

TIMESHARING

IBM VM/370 or CMS training qualifies for CT oppty's to expand svcs in new div's & loc's. Visible user oriented situations offering immed prof growth. **\$37,000 +**

Stan Durbas

Burt Israel
ROBERT HALF
of Hartford, Inc.
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

BUFFALO

MGR TECH SUPPORT

Proven mgmt ability needed to head up dept in charge of communications networking. Fin'l inst needs people-oriented mgr to organize, plan & handle software telecom. IBM 370 IMS shop. **\$35,000**

Bob Collins

ROBERT HALF
of Buffalo, Inc.
1310 Liberty Bank Bldg.
Buffalo, NY 14202
(716) 842-0801

DALLAS

SAUDI ARABIA

Have several positions available. These include mgmt, systems analysis, legal/contract admin, training, database, software and communications. Benefits outstanding. Start date flexible. Salary open.

John Staiger

ROBERT HALF
of Dallas, Inc.
Two NorthPark East, #750
Dallas, TX 75231
(214) 363-3300

SEATTLE

DP MANAGER

Requires 5+ years DP. Data-point experience, COBOL, Databas. Good systems analysis and design experience. **To \$34,000**

Marjie Peterson

ROBERT HALF
of Seattle, Inc.
600 University St., Ste. 2328
Seattle, WA 98101
(206) 624-9000

BOSTON

SR SYS ANALYST

Growing multi-mil dollar CENT MASS mfr has immed need for seasoned MIS indiv. IBM 4341 DOS/VSSE under VM w/CICS, DL-1 & CMS. Hvy user interface in this fast paced EDP shop. Attractive rural country setting. **\$35,000**

OS/MVS SYS PROG

Leading hi-tech mfr seeks astute & systematic internals pro for major upgrades. IBM OS/MVS, IMS DB/DC environ with highly prof staff. Tech challenging pos w/stepping stone up the mgmt ladder. **\$38,000**

IMS PROJ LEADER

Diversified cons svcs firm seeks results oriented pro to lead apps devel team. IBM OS/MVS, IMS DB/DC shop w/distrib proc network. If you're looking for the leading edge + supportive mgmt, this could be for you. **\$34,000**

Gerry Battista

ROBERT HALF
of Boston, Inc.
100 Summer Street
Boston, MA 02110
(617) 423-1200

PROVIDENCE

BURROUGHS 6800 PIA

Major mfg div of Fortune 100 co seeks Burroughs prog/analyst with mfg apps & COBOL programming expertise. Upward mobility for the hi-achiever. Excellent benefits. Near Cape Cod. **\$25,000**

Bob Lathrop

Bob Urion
ROBERT HALF
of Providence, Inc.
400 Turks Head Building
Providence, RI 02903
(401) 274-8700

WESTERN MICHIGAN

SENIOR ANALYST

Capable of project management for on-line MRP development. Working knowledge of IBM 370 or 4300, preference for CICS background. Negotiable around \$30,000, salary reviews at 6 and 12 months.

ROBERT HALF

of Western Michigan, Inc.
180 N. Division, #302
Grand Rapids, MI 49503
(616) 458-2333

MEMPHIS NASHVILLE

DP MGR

Rapidly growing mfg company has System 38 with plans for another. Company needs manager type that knows the System 38 inside and out. Designing experience from scratch preferred. Bonuses and raises twice a year. **\$30,000 range**

SYSTEMS ANALYST

Excellent opportunity to join an outstanding corporation. 3 years systems design experience in financial, inventory and merchandising application. Retail experience preferred. Previous COBOL experience helpful. Excellent benefits. **High 20's - Low 30's**

ROBERT HALF

of Nashville
1101 Kermit Dr., Suite 407
Nashville, TN 37217
(615) 361-4900

ROBERT HALF

of Memphis
825 Ridge Lake Blvd.
Suite 350
Memphis, TN 38119
(901) 683-5800

ROBERT HALF

TULSA

PERKIN-ELMER

Large national company is in search of P-E system programmers for the Texas area. Must communicate well with users. Good relocation pkg and super benefits. Salary open

ROBERT HALF
of Oklahoma, Inc.
5840 S. Memorial Dr., #217
Tulsa, OK 74145
(918) 627-1600

PALO ALTO SAN JOSE

SYSTEMS ANALYSTS PROGRAMMERS

Multiple openings exist for professionals with a background in IMS, OS/VS, COBOL, Banking, Finance, Insurance or Manufacturing applications.

Linda Strickland
Jim Dupre
ROBERT HALF
of Northern Calif., Inc.
2 Palo Alto Sq., Ste. 212
Palo Alto, CA 94304
(415) 493-8700

675 No. First St., Ste. 609
San Jose, CA 95112
(408) 293-9040

TAMPA

PROGRAMMER/ANALYST

We have multiple openings for experienced banking pro's. Customer service to project leaders — IBM.
Salaries range from \$18,000 to \$32,000

SYS PROG

Large IBM mainframe — DOS or OS Sysengs-Cobol-Assembler great.
Salary range \$22,000 to \$38,000

CICS

Conglomerate needs CICS expert. Min two years and presently doing it.
Salary to \$27,000

Stan Allen
ROBERT HALF
of Tampa, Inc.
1311 North Westshore Blvd.
Tampa, FL 33607
(813) 876-4191

COLUMBUS

PROJECT MGR

High caliber firm needs life insurance expertise. Keys to high visibility position begin with project leadership exp, knowledge of systems software development and ability to interface with both vendor and users. Salary \$32-38,000

PROGRAMMER/ANALYST

National firm seeking 3 plus years COBOL and programming exp. Insurance and business applications a plus in this IBM 4341, IMS CICS environment. Salary \$22-26,500

SYSTEMS PROGRAMMER

Very progressive service bureau seeks dual environment exp to work conversion from Honeywell to IBM 4341, MVS, CICS, VSAM shop. Do Networking, Database, and light interfacing with applications.
Salary \$25-35,000

EDP AUDITOR

Degree a must with 4 plus yrs of system analysis and programming. Two plus yrs of actual EDP Auditing highly desirable. Other pluses are IBM, MVS, JCC, and TSO Database exp. Salary \$26-33,000

Faul Bowers
ROBERT HALF
of Columbus, Inc.
88 E. Broad St., Suite 1150
Columbus, OH 43215
(614) 221-9300

AUSTIN

SYSTEMS PROGRAMMER

Degree preferred, 3+ yrs syst programming exp on IBM 4341. CICS+, VM & OS+, Assembler+. \$28,000

FIN'L PROGRAMMER ANALYST

Degree preferred, COBOL, IBM environment, CICS, on-line applications. Retail exp +. \$26,000

Tina J. Romans
ROBERT HALF
of Austin, Inc.
400 E. Anderson, #334
Austin, TX 78752
(512) 635-0883

SAN ANTONIO

SR SYSTEMS PROGRAMMER

Degree preferred. Must have been in systems area or Tech team member for at least 5+ yrs. Also be current on OS/VS, CICS, NCP, Internals, 3705 etc. Large shop needs Sr level person to coordinate and execute Systems updates systems, new development etc. Position is visible and will lead to Mgr slot when capabilities are proven. \$OPEN

SYSTEMS ANALYST

Degree required. At least 5+ yrs in analyst role with OS-IMS-COBOL-PL-1 (a plus)-FOCUS Insurance or Financial apps. If you want a progressive, profitable co environment with no limit for future growth, this one's for you. \$OPEN

OPERATIONS MANAGER

Degree preferred. At least 8+ yrs in DP with last 3 yrs in Supervisor or Mgr role. Data Entry, Control and 3 shifts need attention with documentation, incident reports, etc to be addressed. Very visible. Must have IBM/DOS environment experience. Reports to MIS Director. \$26-30,000

PROGRAMMER ANALYST

Degree preferred. Analyst in financial or retail apps a MUST. IBM DOS/VS COBOL shop, on-line, networking is the environment. A real challenge with no limit to professional growth/earning with this Fortune 50 company. This won't last long. \$26-30,000

Bob Baldwin

ROBERT HALF
of San Antonio, Inc.
6243 I H 10 West, Suite 850
San Antonio, TX 78201
1-800-531-5402
In Texas Dial (512) 736-2467

MILWAUKEE

SR SYSTEMS ANALYST

Opportunity to design new on-line systems for a multi-billion dollar organization. You will need several years of COBOL programming experience & analysis background in an OS/VS environment. Mid \$30's

POTENTIAL DP MANAGER

Join the staff of a very progressive S/34 shop as a Programmer/Analyst. The right person will have the inside track to become the next DP Manager. You will need several years of RPG II programming & analysis experience. \$30,000

Dick Bird
Larry Braden
ROBERT HALF
of Wisconsin
777 E. Wisconsin Avenue
Milwaukee, WI 53202
(414) 271-HALF (271-4253)

KANSAS CITY

DIRECTOR

Leading edge major mid-western hospital seeks an aggressive take charge director. Degree required with a proven track record of management in the medical field. Good technical awareness in a large scale IBM environment required. Salary to \$55,000

SOFTWARE

State-of-the-art MVS shop seeks junior MVS internal programmer who wants to be cross trained in communications and performance tuning. First assignment will be providing software support to regional data centers implementing the latest releases of MVS and IMS. Salary to \$36,000

George Waterman
ROBERT HALF
of Kansas City, Inc.
127 West 10th
Kansas City, MO 64105
(816) 474-4583

NORTH FLORIDA

CONTRACT OPENINGS

We have been retained by a Central East Coast Florida based Insurance Company to locate Data Processing Contract personnel. The positions are Project Leaders, Programmer/Analysts and Programmers. Backgrounds must include IBM, DOS/VS, COBOL, CICS. In addition experience with Insurance applications and DMS Data Base is desired. Length of contracts range from 6 to 15 months. Housing will be provided. Hourly contract rates will depend on positions and experience.

Doug Cook
ROBERT HALF
of Jacksonville, Inc.
9550 Regency Square Blvd.
Suite 213
Jacksonville, FL 32211
(904) 721-0970

SOUTH FLORIDA

SYSTEMS PROGRAMMERS

Expanding division of international corporation has urgent need for software programmers. You must have working knowledge in Large IBM operating systems. Minimum 3 years MVS/JES 2 internal experience or ACF-VTAM system generation experience or 2 years IMS internals with heavy assembler background will qualify you for these outstanding South Florida opportunities. Excellent advancement and comprehensive benefits included. Client pays fees plus relocation. Salary to \$40,000

Chuck Neil
ROBERT HALF
of Miami, Inc.
2655 Le Jeune Road #814
Coral Gables, FL 33134
(305) 447-1757

MINNEAPOLIS ST. PAUL

PROG UNIT MGR

Nationally known medical institution in So Minn needs a scientific research mgr. Req'd: 8+ yrs DP, mgmt exp and statistical programming bkgd. Salary DOQ

Mark David
ROBERT HALF
of Minneapolis/St. Paul
2236 IDS Center
Minneapolis, MN 55402
(612) 339-9001

NEW YORK

FORTRAN ON-LINE

Prominent midtown corporation has a position available for the strong FORTRAN programmer/analyst with 2+ years experience. College degree essential. Our client, a dual Data General installation, has a sophisticated communications network. Applications are varied and include financial, sales and marketing. This opportunity gives a fast track DP pro an opportunity to shine and work closely with top mgmt. Fee Paid. \$28,000

DATAPoint/DATABUS NATIONWIDE TRAVEL

Superior opportunity exists with this prestigious financial conglomerate. This is a high visibility position which requires 100% travel for one (1) year, then home based in NYC. Responsibilities will include supervising the installation of Datapoint Systems with advanced Data Communications, provide on-site support and work closely with vendors and upper mgmt. Strong Datapoint/Databus experience required. Tremendous growth potential and great benefit package make this a unique technical and personal opportunity. Fee Paid. \$35,000

COBOL/OS/IMS

INTERNATIONALLY renowned corporation, has an opportunity available for a strong COBOL/OS programmer with 3+ years experience and knowledge of IMS. Responsibilities include development, maintenance and enhancement of computer audit software. Future growth will include promotion to Product Mgr for IMS. Top-notch skills are required for this sophisticated and technical environment. Fee Paid. \$35,000

WANG VS PROG/ANALYST SYSTEM ANALYST

Our client, a prestigious midtown financial corp, is expanding its DP staff in anticipation of a new WANG system to be installed soon. They are recruiting for 2 DP pro's with a minimum of 2 years interactive COBOL programming experience and good systems design background, on either IBM or WANG hardware. This S/A position will involve limited programming. Excellent ground floor opportunity in all development environment. High visibility with corp management. Fee Paid. \$30,000

ROBERT HALF
of New York
522 Fifth Avenue
New York, NY 10036
(212) 221-6500

DAYTON

EDPEOPLE

Vigorous and growing computer installations require technical guidance. Find new challenge here.

• MVS/JES2, 1-2 yrs exp, 370/303x/43xx environment. \$30-36,000

• MVS System tuning, 1-2 yrs exp, Assembler, Sysengs a+. \$27-32,000

• DOS, Internals & performance tuning, CICS, 43xx environment. 25% travel, company plane. \$22-25,000

Technically speaking. Better positions, by HALF. Fee Paid.

Jim Lee
Susan Robinson
ROBERT HALF
of Dayton
First National Plaza
Dayton, OH 45402
(513) 224-0600

WASHINGTON

SCIENTIST/PROGRAMMER

Washington metro firm seeks scientists to build state-of-the-art computer systems. Requires BS in physical science, math or computer science and 2 years of Fortran or Assembler. To \$28,000

ROBERT HALF
of Washington
7316 Wisconsin Ave.
Suite 401
Washington, DC 20814
(301) 652-1960

SOUTHERN CALIFORNIA LOS ANGELES

MULTIPLE OPENINGS

Don't wait — Winter's around the corner. We need you now! Outstanding openings exist in Systems Programming, EDP Audit consulting. Plus business and scientific applications at all levels. Fee Paid. \$20,000 to \$50,000+

Joe Reese
ROBERT HALF
of Los Angeles, Inc.
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) 386-6805

ORANGE COUNTY

SYSTEMS PROGRAMMERS

Work in sunny Southern California, close to the beach, on large scale IBM hardware with state-of-the-art software. Backgrounds in MVS, Telecommunications and Database are needed. Proven education and work experience can open the door to an excellent career opportunity and a Southern California life-style. Fee Paid. Salary to \$40,000

Al Handler
ROBERT HALF
of Orange County
2333 N. Broadway, #200
Santa Ana, CA 92706
(714) 835-4103

NEW ORLEANS

SYSTEM PROGRAMMERS

If you have a min of 2 yrs Sys. Prog exp, we have several pos available. Past exp must include DOS/VS/CICS/DL1 or IMS. To \$37,000

BANKING

Prog. P/A, S/A, Mgr positions available. Two + yrs banking exp req'd. COBOL, IBM or BURROUGHS, OS or DOS. Tyme-share a+. To \$40,000

ROBERT HALF
of Louisiana, Inc.
4630 One Shell Square
New Orleans, LA 70139
(504) 524-3773

ORLANDO

PROGRAMMER/ANALYST

1-2 yrs exp COBOL & CICS Command level. To \$25,000

SYSTEMS PROGRAMMERS

Multiple openings for MVS, NCP, SNA, VTAM, IMS or CICS a+. To \$40,000

PROJECT LEADERS

Exceptional opportunity for supervisory exp with lg IBM, CICS or IMS. To \$35,000

Pam Evans
ROBERT HALF
of Orlando
2699 Lee Road, Suite 415
P.O. Box 17892
Orlando, FL 32860
(305) 628-2836

PHOENIX

SYSTEMS PROGRAMMER

Several large Phoenix corporations have retained us to recruit for their systems programmer positions. You can take your pick of industry environments. MVS, VTAM, CICS, NCP, EDI/EDL, SNA and IMS opportunities available. Salaries to \$38,000

Ed Caron
ROBERT HALF
of Phoenix, Inc.
3550 N. Central Ave.
Suite 1304
Phoenix, AZ 85012
(602) 264-6408

ATLANTA

SR SYSTEMS ANALYST

Min 5-10 yrs exp with 2-3 in systems design; significant mfg and/or financial systems exp; large IBM equip background; IMS/DB a plus. Low 40's

STAFF ANALYST

Prof IBM 370/150 exp with several yrs COBOL, MVS, CICS experience helps. \$35,000 ±

PROGRAMMER/ANALYST

2+ years exp with RPGII, IBM S/34 and MAPICS software. Design, program & maintain on-line interactive systems; accounting & manufacturing apps; systems 38; and/or MPPII closed loop systems exp pluses. \$25,000

Terence H. White
ROBERT HALF
of Atlanta, Inc.
3379 Peachtree Rd. N.E.
P.O. Box 10201
Atlanta, GA 30319
(404) 266-2153

ALBUQUERQUE

SOFTWARE

PROG/ANALYST

Challenging career position offered to strong IBM technician. Requires 3+ years DOS in Assembler, CICS. Excellent growth potential as co expands operations. Start \$30,000

Dick Starnes
ROBERT HALF
of New Mexico
P.O. Box 3320
Albuquerque, NM 87190
(505) 884-4557

ST. LOUIS

DATABASE ANALYST

Major financial consulting firm seeks an experienced IDMS analyst. This high visibility opportunity requires 2 years with IDMS and BAL. Outstanding company paid benefits. Will be part of implementation team. Salary to \$31,000

TECHNICAL SUPPORT MANAGER

Rapidly expanding software vendor seeks an IBM experienced DP professional. Must be experienced with OS or VM and TSO or CMS. DB expertise a definite +. Previous employment in an information center support environment would be excellent. Salary \$30-32,000

CONSULTANTS/SYSTEMS ANALYSTS

Prestigious national consulting firm seeks several analysts with excellent written and oral communication skills. Must have 3-5 years experience in health care, banking or manufacturing. Degree required. IBM background preferred. Salary \$25-35,000

Randy Pace
Dolores Cook
ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

position announcements

position announcements

position announcements

position announcements

position announcements

SYSTEMS ARCHITECTS

Chart the course of retail systems in the '80s with NCR

Maintaining and further extending NCR's acknowledged preeminence in retail systems calls for a special kind of architect. An orchestrator and innovator who grasps system complexities in their entirety. With the ability to unify interactive and transaction processing... distributed data processing... data base management systems... operating systems... communications networks... processors... terminals and peripherals into a single comprehensive retail system.

Set
the pace
with the
leader

Any of the following positions will give you a highly influential role in shaping the future of NCR retail products... and by extension, the future of the entire retail industry.

Processing Systems Manager

Lead the Processing Systems Architecture group in defining the processor family for complete distributed retail systems. Provide broad current knowledge in OS internals, hardware systems architecture, and modern high level languages. Must have the ability to lead and manage a group of senior systems architects.

Processing Systems Software Architect

Participate in the design of the processor family for complete distributed retail systems. Provide current knowledge and experience in OS design and development, communications networks, data base management systems, and distributed data processing.

Processing Systems Hardware Architect

Participate in a definition of the processor family for complete distributed retail systems. Provide current knowledge and experience in the design and development of CPU's, memory, I/O subsystems, and communications hardware architecture.

Distributed Systems Architect

Participate in a definition of systems management facilities for complete distributed retail systems. Provide current knowledge in distributed systems, in SNA, public data networks, local area networks, transaction processing, CICS internals, and IBM CNM products.

Background should include an advanced degree in CS or equivalent and 6 or more years of systems design/development experience. Salaries will be commensurate with experience and responsibilities. Benefits, including relocation assistance, are what you would expect from an expanding \$3+ billion computer company.

For prompt, confidential consideration, please send your resume with salary history to: Mr. Stephen Green, Personnel Resources, Systems Engineering—Retail, NCR Corporation, Dept. S55, Software Development Center-4, Dayton, Ohio 45479.

NCR

Complete Computer Systems

An equal opportunity employer

Interview with the most

**Dynamic
Computer
Company** in the U.S.

Interviews will be conducted throughout the United States this September. You will interview with the V.P. Engineering and his Department Managers. **Call for an appointment in your area.** We have been retained by a Computer Manufacturer actively seeking **CONTRIBUTORS and MANAGERS** in the \$30-50K range. An executive relocation package is available when appropriate.

Call immediately to schedule an interview. Call collect (603) 472-8844, Rick Stevens/Mike O'Keefe. If not attending, please submit resume.

- Systems Engineers
- Unix Programmers
- Advanced 32 Bit Architecture Design
- Cache/Memory Management
- Diagnostic Programming
- CAD-PCB
- Datamanagement Software

- Commu-Networking
- Office Automation
- Electronic Packaging
- Components Engineer
- Assembly Language Programmers
- Voice Response
- "Never Fail" Processing

Agencies invited to call



Management Advisory Services Inc.

Computer Recruiting Specialists
48 Constitution Drive, Colonial Office Park
Bedford, New Hampshire 03102

All fees assumed by our client company

SAUDI ARABIA

SYSOX INTERNATIONAL, a California Corporation and a rapidly growing systems management company now developing innovative multi-technology systems in Saudi Arabia seeks:

Training Manager

Manage EDP instructors for Saudi Arabian users. Responsible for management of trainers, involved in instruction of computerized information systems. Based in SAUDI ARABIA. Arabic fluency not required. Degree necessary.

DP User Instructors

Experience in COBOL programming using large-scale VM/SP, IBM, OS/MVS, CICS, TP software in a distributed EDP environment. Applicants should have 1-2 yrs. training/instruction background in DP. ARABIC/ENGLISH BILINGUAL VERBAL AND WRITTEN SKILLS REQUIRED. USA or KSA citizenship required due to Visa restrictions.

We offer such benefits as medical, life, ADD, disability, profit sharing, 5 day work week, overseas premium. While based in Saudi Arabia, you will additionally receive 30 working days vacation, 15 holidays, free furnished family housing, free children's education, annual return home travel, paid relocation expenses plus eligibility for new liberal tax exclusions just recently passed.

Saudi Arabia positions are family status and require a 1 yr. commitment in Saudi Arabia for the SYSOX staff. Please send resume to Personnel, SYSOX INTERNATIONAL, INC. 10590 N. Tantau Ave., Cupertino, CA 95014, (408) 996-9363. INDIVIDUALS ONLY APPLY.

SYSOX

Sysorex International Inc.



IDMS ANALYSTS

Computer Task Group, Inc. is a \$40 million Professional Services firm with a national network of 20 offices. We have made a major commitment to providing consulting and application development services to companies using Cullinane's IDMS-82 software products.

We are seeking professionals with 5 years experience in data base/data communication applications and at least 2 years of solid IDMS DB/DC experience.

If you would like to advance your career, join the professional services leader. Send your resume to:

John T. Nitterauer
Director, Recruiting
Computer Task Group
800 Delaware Avenue
Buffalo, NY 14209



No Employment Agencies, please.
An Equal Opportunity Employer, M/F

Hardware Field Engineers

Join our rapidly growing computer service company. We offer unlimited opportunity to those with initiative and ability. SysTec provides a full benefit package, top salaries, and participation in SysTec's future.

SPECTRA 70 Opportunity for field engineers with Spectra 35/45 experience - US and overseas locations available. We also need IBM 360/370, 303X engineers.

If you are ready for a company where your abilities and contributions will be recognized and rewarded call today. At SysTec you are not just a part of the company...YOU ARE THE COMPANY.

Phone: 800-327-2202 In Fla. 305/323-0230

SysTec

2715 Navigator Ave.
P.O. Box 2015
Sanford, Florida 32771

Equal Opportunity Employer m/f

position announcements

position announcements

position announcements

position announcements

position announcements

A Good Fit is Worth Looking For



A good career fit is often hard to find...and definitely worth looking for.

If you're an IBM DOS, DOS/VS or DOS/VSE operating systems professional, you don't have to look very far. Nixdorf Computer Software Company is a well-known and well-respected company with a national reputation for quality products and satisfied customers.

We offer the perfect environment for personal and professional growth. At Nixdorf Computer Software Company, you'll work with other talented professionals on state-of-the-art product development and support. In an atmosphere where your creativity is an integral ingredient to our company success.

We offer a complete benefits program, including: Health, major medical, life, dental, prescription drugs, short-term and long-term disability, relocation, vacations and holidays, savings and investment plan, and direct pay deposit.

If you're interested in an outfit that's tailor-made to your talents and ambitions, while affording you with room to grow, look to Nixdorf Computer Software Company.

NCSC maintains corporate headquarters in Richmond, VA as well as regional offices in Chicago and Dallas. Currently openings are available at both our Richmond and Chicago facilities.

For these positions you should have a familiarity with IBM DOS, DOS/VS, DOS/VSE or EDOS operating systems and be proficient in Assembly language programming.

Richmond Corporate Headquarters

Sr. Technical Writer

Provide user documentation for our operating system products. We seek a professional whose talents combine systems programming experience with strong technical writing skills.

Technical Education Specialist

Conduct in-house and customer education for our operating system products. Instruction proficiency and systems programming or operating systems background is desired.

Software Support Programmers

Provide customer support for our operating system software and related software products, be responsible for enhancements and program fixes to operating system products. Requires systems programming experience with a background in customer contact and troubleshooting desired.

Software Programmer/Software Engineers

Working in Development Division, involved in creating system software products. Experience in the design, development, and/or modification of system software required.

Chicago Regional Office

Systems Programmer

As a member of the teleprocessing team, a solid understanding of spooling and job entry subsystems is required. Experience with one or more of the following is desired: BTAM, VTAM, RTAM, JEP, POWER, and EXCP Channel programming, subtasking, interrupt handling, BSC and SDLC protocols and multileaving.

Internal Systems Support Programmer

Provide supportive system software services, including operating system gens, installation and maintenance of program products, creation of utility and test procedures, programs and datasets. Requires minimum 2 years' systems programming experience and 1 year of VM/CMS IBM program product installation experience desired.

If you're interested in one of these opportunities, please forward your resume, including salary history to: Mike Duffer, Technical Recruiter, Nixdorf Computer Software Company, 6517 Everglades Drive, Richmond, VA 23225.

Or call — Outside of Virginia — TOLL FREE 800-446-9900. In Virginia, 804-276-9200. We are an equal opportunity employer m/f/h.

Committed to Success

NIXDORF COMPUTER SOFTWARE COMPANY

**NIXDORF
COMPUTER**

position announcements

position announcements

position announcements

position announcements

position announcements

why would d.p. professionals work in a hospital?

The same reasons they'd work anywhere. A professional working environment. State-of-the-art hardware. Superb benefits. Excellent salaries. But that hospital is the Deaconess, so you'll also be working in our new two-story Data Processing Center, in an atmosphere of cooperative support that's unique for a D.P. environment. Reasons enough?

programmer/ analysts

We are looking for Programmer/Analysts who are currently familiar with IBM 370 or 4300 equipment. An in-depth knowledge of **COBOL, DOS/JCL and VSAM** is absolutely essential. While exposure to CICS and/or DL 1 would be helpful, an individual with the right credentials will be trained. Will receive exposure to Data Base and On-Line Transaction. **A minimum of 2 years' work experience in a DOS environment is required.**

Positions are available in the following areas:

• Personnel/Payroll • Billing • General Applications

assistant systems programmer

We are seeking an experienced individual to fill this position to assist the Senior Systems Programmer. Duties will include the maintenance of all systems software, systems libraries, and normal systems program duties. Minimum qualifications are 2 years with the following: **DOS/VSE or DOS/VS, VSAM, JCL, COBOL, PL/1 or ASSEMBLER, CICS and DUMPREADING.** Experience with ICCF, ADR, PANVOLET XEDIT, EDGAR would be helpful. Any exposure to SYSGEN, SIPO or V/M is a plus.

We provide exceptional salaries with an extensive benefit portfolio that includes dental, group health, optical and prescription plans as well as personal fitness programs, 3 weeks' vacation, tuition reimbursement, life insurance, and more... plus the convenience of our Longwood Medical Area location.

Please forward resumes to: Larry Hunt, NEW ENGLAND DEACONESS HOSPITAL, 185 Pilgrim Road, Boston, MA 02215. An equal opportunity/affirmative action employer.

A Special Place . . . A Special Place



New
England
Deaconess
Hospital

LEAD SYSTEMS PROGRAMMER Southeast Hill Country

Reporting directly to Vice President, responsible for management of DOS/VSE conversion to MVS; supporting data operating system and telecommunication activity; providing technical support to development. Actively involved with Vice President in hardware and software selection; planning distributed processing and data base and office automation.

Systems programming experience required in IBM MVS, CICS. Exposure to software packages helpful.

Opportunity to build a professional systems staff and assume increased management responsibility in an attractive small-town sunbelt location.

Starting salary to \$35,000. Outstanding relocation package includes home purchase.



Bill de Funiak, FLMI
314 N. Garfield
Hinsdale, IL 60521
(312) 887-9790

Jack Edwards, FLMI
380 Maple Ave. West
Vienna, VA 22180
(703) 281-0919

DP MANAGER

Unique career opportunity in the heart of the sunbelt in Oklahoma City: Founded in 1946, the Oklahoma Medical Research Foundation is a \$15,000,000 private, nonprofit medical research organization. OMRF is one of the foremost nonprofit medical research facilities in the nation. 13 person DP staff supports administrative, financial and scientific functions.

Current state-of-the art environment includes IBM 4341 VM/CMS, VSI operating systems utilizing enviroyl and total DBMS in an interactive environment. Technical experience must include:

- IBM hardware
- OS operating system
- Cobol and assembler
- Data base
- Evaluation of hardware and vendor software
- Supervision of other DP personnel

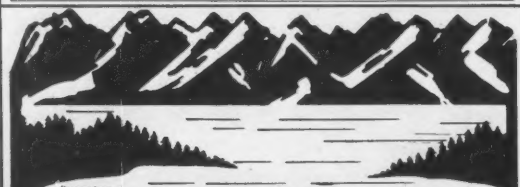
Call or send resume:

Chip Morgan, Personnel Director
825 N.E. 13th Street
Oklahoma City, OK 73104
(405) 271-7430



OKLAHOMA
MEDICAL
RESEARCH
FOUNDATION

An Equal Opportunity/Affirmative Action Employer



PROGRAMMER ANALYSTS SYSTEMS ANALYST SYSTEMS PROGRAMMER

Internal expansion has created an immediate need for degreed (math or physical sciences) programmers with 2-4 years experience on the large IBM mainframes. (We have a 3031 - MVS, CICS). The ideal candidates for Systems Analyst will have an Engineering/Math/Statistical background with relevant experience.

We're offering relocation, a top salary/benefit package, and best of all - Reno, Nevada: Summer and winter sports at Tahoe, and an unbeatable outdoor family lifestyle!

Please send resume to:

PROFESSIONAL STAFFING
SIERRA PACIFIC POWER COMPANY
P.O. BOX 10100
RENO, NEVADA 89520

An Equal Opportunity Employer M/F H/V

FLORIDA SYSTEMS PROGRAMMERS

LARGE, MODERN, TECHNICALLY SOPHISTICATED CLIENTS located in the SUNSHINE STATE have requirements for OPERATING SYSTEMS SOFTWARE SPECIALISTS in the areas of DATA COMMUNICATIONS or COMPUTER PERFORMANCE MEASUREMENT or OPERATING SYSTEMS SUPPORT. Experience with IBM, DOS/VS or MVS or VM/370 or IMS or CICS or VTAM or 3705 and ASSEMBLY LANGUAGE are desirable. Please submit RESUME or CALL (to 8 PM EST).

RICHARD MADDOCK AND ASSOCIATES, INC.

PERSONNEL CONSULTANTS

Phone (813) 933-5838

P.O. BOX 271431, TAMPA, FL 33688

position announcements

position announcements

position announcements

position announcements

position announcements

SOFTWARE

QUIETLY REVOLUTIONIZING SOFTWARE.

The first to introduce three levels of integrated software: database, applications and graphics. The first computer software products company to be listed on the New York Stock Exchange (CUL). The most financially successful computer software company in the country. Growing at a rate of 54% per year, when the industry average stands at 30%. **Cullinane Database Systems, Inc.** is fast becoming synonymous with Software. Shouldn't you find out why?

Systems Software Development

Requires creative, highly motivated professionals with extensive background in systems programming or control systems software development. Results-oriented, customer responsive environment. Development openings are within the following groups:

- Database
- Data Communications
- Integrated Data Dictionary
- On-Line Query
- Audit-Retrieval
- Application Development System

Applications Software Development

Requires senior level (minimum 3-5 years) experience in design, development and implementation of financial (general ledger, A/P, A/R, etc.) or manufacturing applications. Database background essential. Project leadership experience desirable. Good communication skills and ability to work independently.

Technical Support Specialists

Professionals with a high degree of expertise are needed to provide technical support via the telephone to **Cullinane's** growing community of users. Success in this role requires the demonstrated ability to interact and communicate effectively with users. Requires extensive Assembler with experience in one or more of the following: 3-5 years in systems programming; database systems such as IDMS or IMS; on-line systems such as IDMS/DC or CICS; installing and maintaining BTAM, VTAM or TCAM. Occasional travel required. Opportunities are available at our District Support Centers in Atlanta, Chicago, Los Angeles and Philadelphia as well as in our Headquarters in Westwood, MA.

For prompt, confidential consideration, please forward resume, specifying position of interest, to Carolynn Levy, Dept. 913CW, **Cullinane Database Systems, Inc.**, 400 Blue Hill Drive, Westwood, MA 02090.

Database Software Sales Representatives

Excellent opportunities for sales professionals who can demonstrate a successful track record in vendor software sales or have a strong background in data processing/database management with IBM or compatible equipment. Opportunities are available in Chicago, Los Angeles, New York and New Jersey.

Product Marketing Manager

• Manufacturing Systems

An exceptional opportunity is available for an individual who possesses a high degree of technical expertise and the ability to communicate systems concepts to prospective users and our own field sales organization. Qualified candidates should possess excellent presentation skills and be able to develop multi-media presentations and various sales support tools. A full degree and some marketing exposure helpful.

For prompt, confidential consideration, please forward resume, specifying position of interest, to Roy Evarts, Employment Manager, Dept. 913CW, **Cullinane Database Systems, Inc.**, 400 Blue Hill Drive, Westwood, MA 02090.

P.S. If you're a software professional and you're in the area Wednesday or Thursday, September 15 or 16 from 5-9 p.m., consider this your invitation to attend our Open House at Corporate Headquarters in Westwood, Massachusetts to discuss these and other opportunities.



Cullinane

An Equal Opportunity Employer

NEW ENGLAND'S FINEST

Quite simply, that's what we offer our applicants: contact with the **FINEST** Companies in New England. Through years of specialization in EDP and Engineering placement, we have a broad base of industrial, insurance, banking, defense, and service clients with openings at every level, including:

SOFTWARE ENGINEERS	TO 45K
CAD/CAM DEVELOPMENT	TO 45K
SYSTEMS PROGRAMMERS	TO 40K
PROJECT LEADERS	TO 38K
PROGRAMMER/ANALYSTS	TO 32K

Send resume or call toll free: 1-800-628-3374. In Massachusetts call (collect): 413-781-0982.

MEMBER
npo
130 affiliates
coast-to-coast

dp Specialists
DYNAMIC PERSONNEL SYSTEM
P.O. Box 539
West Springfield, MA 01090

Scientific Database and Systems Development Coordinator

American Society for Metals, the world's leading source of technical information on metals, and the National Bureau of Standards are conducting a joint program to gather, evaluate, compile, disseminate, and store numerical and graphical data and textual information on alloy phase diagrams. Alloy phase diagrams are cornerstones of metallurgical technology that summarize the many characteristics and capabilities of existing and theoretical alloys. A key function in the program is the computerized information system for inputting, manipulating, storing, and retrieving data that flow through the program.

The Database and Systems Development Coordinator will be responsible for developing software systems and establishing operation of the database, including interactive output capability. The position is located at National Bureau of Standards headquarters at Gaithersburg, Maryland. Candidates should present their formal education and background in science and technology areas, and should be completely familiar with state-of-the-art method in numeric and graphic data storage and retrieval, and in systems and software analysis and development. Experience in metallurgical or materials engineering is a plus. The position is available immediately.

Please submit your letter of interest, resume, and salary history and expectation to:
Mr. Hugh Baker
ASM Manager
Alloy Phase Diagram Program
AMERICAN SOCIETY FOR METALS
Metals Park, Oh 44073
An Equal Opportunity Employer

DATA BASE ADMINISTRATOR

Cleveland Electric Illuminating Company an electric utility serving north east Ohio is seeking an individual, preferably with a degree, to provide total technical support in the data base administration area. Candidates must have 3-5 years experience as a data base administrator in IMS/VS shop. Also should have experience in monitoring and tuning of data bases, physical and logical design, data base back up and recovery, and documentation and procedural developments. IBM Data Dictionary desirable. Salary commensurate with experience and qualifications. Excellent benefit package. Will pay relocation expenses. Interested candidates must forward resume with complete salary history. **No telephone calls will be accepted.** Please forward resumes to:

Doris H. Holland
Cleveland Electric Illuminating Co.
P.O. Box 5000, Rm. 203
Cleveland, OH 44101

position announcements

position announcements

position announcements

position announcements

position announcements

SOFTWARE PROFESSIONALS

At Sperry Univac YOU Make It Happen!

Because Sperry Univac's most important asset is its people, the emphasis is on YOU—the software professional. Our involvement includes the management, design and development, test and implementation, as well as life-cycle support of software projects using multiple languages on a variety of hardware. To sustain our continued growth, we are currently seeking innovative career-oriented software professionals with 2+ years experience in any of the following:

- UNIVAC 1100 COBOL, ECL, DMS, TIP, CMS, EXEC. & INTERNALS, OR APPLICATION PROGRAMS
- AN/UYK-7 NTDS & CMS-2
- CP-901 ASW PROGRAMS

- VAX 11/780
- MISSILE FIRE CONTROL PROGRAMS
- MICRO/MINI COMPUTER WITH ASSEMBLER/FORTRAN & EW EXPERIENCE
- AN/UYK-20 & CMS-2/SDEX-20
- ELECTRONIC WARFARE
- FORTRAN WITH VAX/VMS OR RSX-11M O/S

Currently, we have openings at over 15 U.S. locations. If YOU're interested and would like to learn more about us and the opportunities available to you, call Patrice Gironde at (703) 558-7242 or send resume to her attention at: Sperry Univac Technical Services Division 1901 N. Moore Street Arlington, Virginia 22209

SPERRY UNIVAC

An Equal Opportunity Employer M/F/H/V

Systems & Programming Professionals

Major New Development!!

The St. Paul Companies, one of the Fortune 50 largest diversified financial companies, is undertaking major new development efforts in our data processing division. We need DP professionals with 4+ years of experience on large IBM with OS/MVS and COBOL. Experience with large systems (policy processing and PMS) is desirable, along with TSO/SPF and CICS.

Our office is located in suburban Woodbury, Minnesota (9 miles from downtown St. Paul) and offers opportunities to work with current IBM hardware and software. The St. Paul offers competitive salaries, a professional working environment, a relocation package, training opportunities and tuition reimbursement.

Interested? Send your resume or call 1-800-328-1327 for further information.

The St. Paul
Property & Liability
Insurance

THE ST. PAUL COMPANIES
P.O. Box 43271
St. Paul, MN 55164
ATTN: Marsha Othoud
Equal Opportunity Employer M/F

MIS MANAGER

Kingdom of Saudi Arabia

We are an American Company which is expanding our efforts in the Kingdom of Saudi Arabia. We are responsible for designing, installing and maintaining a large-scale EDP system for the government of Saudi Arabia. You will need 10-15 yrs. exp. in data processing with a minimum of 7 yrs. exp. in management. Your management experience should include budget (profit/loss preferable), equipment selection, employee selection and executive reporting relationship.

Your technical experience should include operations exp. with large-scale computers utilizing teleprocessing, IBM/IBM equivalent large-scale hardware and software.

You will have substantial interface responsibilities with the Saudi Arabian representatives. We prefer you to have experience dealing with international clients. This position offers many outstanding compensation advantages and features. This position is family status.

Please respond to:
CW-A3322
Computerworld
Box 980
Framingham, MA 01701

EDP PROFESSIONALS TRAINING AND TECHNOLOGY, THAT'S THE HUMANA DOUBLE FEATURE!

Humana Inc., one of the nation's leading hospital companies, based in Louisville, Kentucky, is seeking experienced EDP professionals. Our state-of-the-art IBM installation includes both large CPU capability as well as an extensive distributed network. Our IBM 3081 equipment includes MVS operating system, JES2 and CICS. If you have the desire to learn and improve your skills, Humana will give you the training and tools to do the job. Consider the following excellent positions currently available:

• SYSTEMS PROGRAMMERS

Successful candidates will have 4-6 years EDP business system experience with specific background in the design and implementation of advanced, complex system software. Degree preferred.

• ADVISORY SYSTEMS PROGRAMMERS

These positions require 4-5 years experience as an Advisory Systems Programmer with specific expertise in writing detailed programming specifications in COBOL, CICS, and TSO. Degree preferred.

You can look forward to an exceptional starting salary and a comprehensive benefits package. Coupled with our formal training and career development programs, we offer excellent opportunities for professional advancement. For consideration, please submit your resume with salary history in confidence to:

Tom McGee

Humana

P.O. Box 1438
Louisville, KY 40201

Equal Opportunity Employer M/F

ROBOTICS

Central New Jersey
\$30-\$45K

Major R&D center of Fortune 100 co. seeks MS or PhD in Computer Science, EE or ME.

Development of re-programmable automation technology. Micro-processor based control system. Project responsibility & development from inception thru to implementation.

Due to rapid expansion 12 openings exist with this excellent firm. All fees and relocation expenses paid. Call/Resumes to:

J. ROGERS
(609) 771-8282

JANE ROGERS ASSOC
2999 Princeton Pike
Lawrenceville, NJ 08648

NORTHEAST REGION MANGER COMPUTER GRAPHICS SOFTWARE COMPANY

We are a leading Colorado-based Developer of Graphics Software tools with a superb, worldwide customer base of end-users and OEM's including many Fortune 500 companies. We seek an experienced professional to manage and expand our regional network of sales representatives. Positions are available in the Northeast and Central Regions and requires 50% travel.

Applicants should have a minimum of three years' proven track record in both selling and sales force management. Must have excellent negotiation and closing skills and be experienced in managing long, hard sales cycles. Experience in selling software or graphics products is highly desirable.

Reports directly to the Director of Sales. This person will receive a very competitive compensation package. Send resume, references and other pertinent data to Nancy Root, Precision Visuals Inc., 250 Arapahoe, Boulder, CO 80302.

Equal Opportunity Employer

SYSTEMS PROGRAMMER

The Charter Company has an immediate career opportunity for an experienced systems programmer. Our multi-CPU, large scale data communications network, currently supports VM, OS/VS1, and DOS/VSE.

A minimum of 1 year in DOS/VSE or OS/VS1 systems generation and software maintenance is required. VSAM and/or CICS knowledge or expertise is helpful.

We offer an excellent starting salary, a substantial benefits package, and an environment that recognizes performance and encourages creativity.

We'd like to welcome you to our team! Mail your resume and salary history, in confidence, to:



Manager of Employment
The Charter Company
21 West Church Street
Post Office Box 2017
Jacksonville, Florida 32231

(For additional information, call 904-358-4107)

An Equal Opportunity Employer M/F

position announcements

position announcements

position announcements

position announcements

position announcements

NATIONAL UNIVERSITY OF SINGAPORE

COMPUTER CENTER

The University Computer Center is equipped with an IBM 4341 mainframe computer and an HP3000 computer. To boost the computing capacity of the existing facilities, the Center will soon be installing a more powerful mainframe. Parallel with upgrading its hardware facilities, the University invites applications to join its software team in maintaining and upgrading its services to the University's user community.

Systems Programmers

Applicants should possess a degree in computer science or a basic university degree with relevant computing experience. Knowledge of IBM operating systems is essential, in particular, VM/CMS and/or MVS. Preference will be given to candidates with working knowledge of IBM370 ASSEMBLER language. Successful candidates will be responsible for supporting and tuning the mainframe computer operating system.

Systems Analysts/Programmers

Applicants should possess a degree in computer science or a basic university degree with experience in systems analysis/programming. Successful candidates will have the opportunity to design, implement and maintain computerized systems.

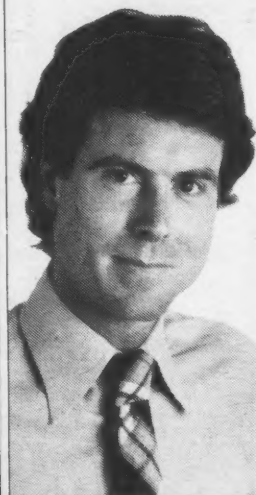
Gross monthly emoluments range from S\$1,600 to S\$4,150. (U.S. \$1.00 = S\$2.16 approximate) Commencing salary is commensurate with qualifications, experience and level of appointment. The University also pays a 13th month allowance. Leave, medical and provident (retirement) fund benefits are available.

These are key positions and offer the right candidates excellent opportunities for career development and advancement.

Application forms and further information on terms and conditions of service are obtainable from:

Mr. Peter Lim, Director OR The Director of Personnel
North America Office NATIONAL UNIVERSITY
OF SINGAPORE
61 West 62nd Street, Suite 4J
New York, New York 10023
(212) 765-1670
Kent Ridge, Singapore 0511
Republic of Singapore

"Etna works for me."



"When I started as a systems programmer five years ago, I made a commitment to work only where a commitment has been made to me. Etna is that place. And hardware is one reason why."

"Etna has one of the largest IBM installations in the country, so there's never a hassle finding an open terminal when I need one. It's the perfect environment for me to do the job I'm capable of."

"But Etna's commitment to data processing doesn't stop there. The software is state-of-the-art, too. The training program is teaching me more than I already know. There are great benefits, including Life, Medical, Dental, and Disability Insurance. And best of all, they pay me what I'm worth."

"Sure, I work for Etna. But only because Etna works for me."

If you have 1-5 years' experience, call or send your resume to Mary Scott, (203) 273-3790, Recruiting Office, Etna Life & Casualty, 900 Asylum Avenue, Hartford, CT 06156. An equal opportunity/affirmative action employer.

**Experienced Systems
Programmers and
Programmer/Analysts
wanted now.**

Etna

INTERESTED IN "TOMORROW'S TECHNOLOGY TODAY"?

If you answered "NO"
Disregard these opportunities!

However, if your response is positive, we urge you to read on. We're ANACOMP, the innovators who in just 12 years have become one of the largest publicly held corporations in the competitive computer services industry. Specializing in software development, on-line services, facility management, minicomputer systems, and micrographics; we answer the ongoing needs of both government and private industry sectors. While our scope is already extensive, our potential is virtually limitless. Yours may be, too!

Right now, we're seeking bright, ambitious and aggressive data processing professionals for the following locations and positions:

SARASOTA, FLORIDA

divisional headquarters for financial services and software development.

CAN YOU DESIGN AND IMPLEMENT A SYSTEM WITH:

- Several million accounts
- Real time
- Data Communications
- A million transactions a day
- Distributed Processing
- Data Base
- On line

Software Simulation Modeler

Minimum 2 years experience in software simulation. We desire background in some of the following: "Best 1" performance monitor experience, Data Base access time, MVS overhead T.P. network and forecasting exposure "Crystal".

Analysts/Programmers

Minimum requirements are 3 years IBM COBOL with some experience with IMS, IDMS, or CICS.

Software Specialists (IMS or MVS)

Minimum 3 years experience in the generation, installation and support of IMS or MVS. We desire a background in some of the following: G.I.S., strong T.P., Performance Tuning, SMP-4 and OS JCL.

Data Communications Specialist

Minimum 2 years experience with NCR mainframes, terminal networks, telecommunications troubleshooting in a multiple vendor environment. This position ONLY is in Saudi Arabia.

Customer Account Manager

Ideal background would be a large scale bank operation (deposit or lending), be very knowledgeable in DP procedures, customer liaison, interdepartmental liaison. Duties also include quality assurance, develop marketing materials, prepare proposals, perform system surveys/modifications, and liaison with product managers. Degreed individual preferred.

Marketing Support Representative

Individuals should have good working knowledge of IMS/IDMS, comprehend specifications and explain architecture, data structures, recovery-restart, etc. through understanding of banking support very important. Will learn ANACOMP's proprietary software in a primary support situation of major banks. IBM systems background very desirable.

ANACOMP, INC. recognizes the talents of each employee with highly competitive salaries plus merit bonus plan. Our benefits include: relocation expense plan, dental/medical insurance, life insurance, tuition reimbursement, profit sharing plan, and stock purchase plan. As we expand, you can expect unprecedented professional and personal growth opportunities with a company that is on the way to the top...If qualified or interested in any of the above positions, please respond to:



Frank Divito
813-366-2600
(collect calls accepted)
ANACOMP, INC.
1390 Main Street
Sarasota, Florida 33577

An Equal Opportunity Employer M/F
Other career opportunities available in
New York, Philadelphia or Cleveland.

MAINE

We have specialized in data processing professional placement in Maine for almost a fifth of a century. If you qualify for positions in the \$25-35,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC
477 Congress St.
Portland, Maine 04101
(207) 773-4749

SYSTEMS PROGRAMMER

We are a nationwide truck and trailer rental company located in Miami, Florida. IBM 3031 OS/MVS NCP/VTAM IMS DB/DC JES2 TSO/SPF COBOL.

IMS SYSTEMS

Install and maintain IMS DB/DC. ADF/COBOL application support and performance tuning desirable.

NCP/VTAM SYSTEMS

Install/maintain communications software. MVS or IMS experience helpful. Send resumes to:



Valerie Friedman
MIS Department
P.O. Box 343799
Coral Gables, FL 33134
(305) 448-8788, Ext. 202

position announcements

position announcements

position announcements

position announcements

position announcements

DATA COMMUNICATIONS SPECIALISTS

You can step into a wide open opportunity with the most dynamic company on the data communications scene today.

PCI designs and manufactures a line of SNA/SDLC to ASCII protocol converters. We were the first in the protocol conversion game and we're ahead of the pack with products that are the best on the market—and, for certain applications, we manufacture the only product.

We are looking for data communications specialists/managers/directors with intimate knowledge of IBM's System Network Architecture—who want to break out of the mold.

We are expanding rapidly and need people to open new regional offices in

Chicago, San Francisco, Hartford, Dallas, and Washington, D.C. These are ground-floor management positions.

This is a unique opportunity to use your data communications skills to excel professionally and economically. This kind of opportunity is rare at any time—but especially today.

If you've got the detailed knowledge of SNA that we require plus a desire to step into a dynamite marketing challenge, send your resume to:

Addison Woods
Manager, National Accounts
PROTOCOL COMPUTERS, INC.
6430 Variel Avenue, Suite 107
Woodland Hills, CA 91367

PCI
PROTOCOL
COMPUTERS, INC.

MUMPS Systems Programmer

We are seeking an exceptional individual to support our advanced ANSI-Standard MUMPS software system for VAX and PDP-11 computers. You should have substantial experience in VAX/RSX system programming, MUMPS applications programming, or equivalent.

InterSystems is a Boston-based software firm with worldwide clients, a superb reputation among its customers, and a record of solid financial success. You will be based in our attractive waterfront/Quincy Market office, and will have comprehensive maintenance/development tools at your disposal.



InterSystems

InterSystems Corporation
210 Commercial Street / Boston, Massachusetts 02109
Telephone 617 227-1555

Give us your resume

We'll give YOU San Francisco!

Some people come to sail on the Bay, some to ski in the Sierras, and some to snuggle in Santa Cruz. But the professional climate is the real reason, and every bit as exciting.

There's nobody better qualified than CRG to introduce you to San Francisco. We've been here longer—over 10 years—know everyone in EDP worth knowing, and our list of client companies reads like the Who's Who of the business world.

Send your resume today, or call. All fees, interview, and relocation expenses are paid by our clients.

Computer Resources Group, Inc.
303 Sacramento St., San Francisco, CA 94111
(415) 398-3535 or 3333 Bowers Ave., Santa Clara, CA 95051,
(408) 727-1658



CRG AFFILIATES IN 27 MAJOR U.S. CITIES

An employer-retained professional placement service

the CAD/CAM system comparison seminar

NOTE: ADVANCED LEVEL — no introductory material

Seminar Leader: **Dr. Joel Orr**

OCTOBER 6-8, White Plains (nr. NYC)

The in-depth comparison of the leading **CADD** systems in this 3-day seminar will equip the serious enquirer for system selection — mechanical, electronic, architectural.

- **PRICE:** \$150.00 book by Foundry to first 50 registrants
- **LEARN** Joel Orr's Comparison Methodology.
- **GET** 900-page CADD Comparison Seminar Manual containing data, charts, visuals, evaluation tables, etc.

CAD/CAM INSTITUTE, 21 Chambers, Danbury, CT 06810

CALL NOW
or
request information
JOEL ORR at
863/740-8844

Senior Systems Analyst/Programmer

Retailer located in the Midwest has plans to expand nationally. Immediate opening for Senior Systems Analyst/Programmer, with retail experience. Must have at least 5 years experience. Responsible for development of third generation retail systems. Prefer experience on DEC 20/60. IDMS experience and structured programming techniques. Excellent salary and fringe benefits. Relocation expenses. Send resume to:

Human Resources Manager
P.O. Box 266
Moberly, MO 65270.

SRL SYSTEMS ANALYST/PROGRAMMER

Design and implementation of computer systems related to financial institutions. Consults with managerial and programming personnel to clarify program intent. Divides up program assignments. Analyzes test runs & directs any necessary corrections using COBOL & ASSEMBLER language. Also reviews programs to increase efficiency & conserve storage space. Bachelor degree or equiv. in Com. Sci., Math., Data Processing or Physics. Must have knowledge in COBOL & ASSEMBLER. 3 yrs exp. \$32,000 per yr to work 37.5 hrs/5 days/wk. PLEASE SEND RESUMES TO: Cap-CPP Services, Inc. 821 Fifth Ave. New York, NY 10178

TECH SUPPORT

Major Massachusetts Data Center has retained us to staff several positions due to continuing growth - IDMS Specialist to \$35K; DOS/VSE Systems Programmer to \$33K; Also an open position for a Manufacturing Analyst with Conserve - Armap experience to \$40K. Excellent location and competitive benefit package, including relocation. For more details call Debbie Liebes.

Dunhill

of Worcester Inc.
370 Main St., Ste. 730
Worcester, MA 01609
(617) 798-0116

IMMEDIATELY AVAILABLE

...With fast-track, growth oriented firms

MGR. MFG. SYSTEMS
To \$55,000 +
MRP, Order Entry, Distributed Processing

EDP AUDITOR
To \$50,000
NYC, Corp. Headquarters

HW/SW EVALUATOR
To \$45,000
Main Frames/Minis - NJ

PROJECT MANAGER
To \$45,000
Banking - NYC

SYSTEMS ANALYST
To \$40,000
Manufacturing Systems - Metro NYC

PROJECT LEADER
To \$36,000
Systems 34 or 38 - N.J.
CALL OR WRITE FOR IMMEDIATE, CONFIDENTIAL INTERVIEW
(212) 557-1000

Fortune
PERSONNEL CONSULTANTS, INC.
505 Fifth Ave., NYC 10017
FEE PAID Agency

PROGRAMMER. In charge of structuring, coding, & debugging programs for applications relating to financial institutions. H.S. diploma or equiv. Must have knowledge of COBOL & ASSEMBLER. 2 yrs or 2 yrs in programming. \$446.50 per wk to work 35 hrs/5 days/wk. PLEASE SEND RESUMES TO: **Atlantic Information Systems, Inc.** 575 Madison Ave, Ste. 1006 NYC 10022.

LEAD ANALYST

Participate in systems analysis for user functions. Includes analyzing current procedures to custom-tailor systems for user needs. Requires 5 years systems experience, IBM mainframe experience, knowledge of COBOL and proficiency in OS JCL, UTILITIES required.

Salary: \$34,008 per year. Five day week, 35 hours (8:45 a.m. to 4:30 p.m.). Apply to:

THE HOME INSURANCE COMPANY
59 Maiden Lane
New York, NY 10038
(212) 530-6474
Equal Opportunity Employer

DATA BASE SPECIALIST

Live in sunny El Paso, an area noted for fine year around climate, clean air, low taxes and housing costs and lack of urban congestion. If you are a college graduate, have 3 to 5 years of Administrative Data Processing experience, and have a minimum of 1 year of in-depth technical experience in DBMS work, the University of Texas at El Paso has an immediate opening for you. To find out more call (915) 747-5445 or mail a resume and salary history to: **Personnel Department, University of Texas at El Paso, El Paso, TX 79968.**

The University of Texas at El Paso is an Equal Opportunity/Affirmative Action Employer.

HONEYWELL PROGRAMMER

DM-IV-TP
COBOL
GCOS
IDS-II

Automation Technology
P.O. Box 7137
Elkins Park, PA 19117
(215) 885-4880

VETERINARY MEDICINE COMPUTER ANALYST

The College of Veterinary Medicine, Mississippi State University, is accepting applications until June 1, 1982, for the position of Computer Systems Analyst. The position will coordinate the development and operation of both hardware and software of the CIM computer system. Responsibilities include maintaining the operating system for micro and mini computers and the design and implementation of the system. Applicants should possess a BS degree in computer science or related area. Two years of experience related to micro or mini equipment, experience in data base management systems and programming is desired. Extensive experience may be substituted in lieu of a degree. Interested applicants should send their resume to Mr. C. Ray Hayes, College of Veterinary Medicine, Drawer V, Mississippi State, MS 39762. Mississippi State University is an equal opportunity affirmative action employer.



Take the
shuffle
out of the
search.
Subscribe
to the
Computer-
world
Index.

[For details, call or write
our Circulation
Department]

COMPUTERWORLD



position announcements

position announcements

position announcements

position announcements

position announcements

Computer Professionals

The Greening Of Your Career

There's more to your career than your job...there's your lifestyle. And Bendix's ideal Maryland locations offer an extraordinary way of life: ENJOY SAILING?...our NESEA Operations at the Patuxent River NAS is minutes from the Chesapeake Bay...sailing capital of the world; APPRECIATE BEAUTIFUL LANDSCAPES?...our headquarters facility in Columbia, right in the midst of Howard County's newest community, is suburban living at its best, close to Baltimore and Washington, D.C. WANT TO BE WHERE THE ACTION IS?...our operation at the NASA Goddard Space Flight Center in Greenbelt is on the doorstep of our nation's capital—offering the finest in cultural and recreational opportunities plus a cosmopolitan excitement like no other.

And your professionalism will be enhanced, too. With Bendix you will work with top professionals and the very latest data processing technology on challenging new projects involving communications, navigation, satellite tracking and space explorations. As a world leader in the service industry, we have the resources, expertise, contract awards and achievements to guarantee your career success.

We seek creative Computer Professionals with the talent and momentum to achieve in the following capacities:

PROJECT SYSTEMS/ANALYST

—Requires BS Degree plus 4 years experience in systems test/analysis of large computer systems using scientific languages.

PROGRAMMERS/SR.

—Positions require BS Degree with a minimum of one year experience in one or more of the following:

Equipment:

PDP-11, HP 1000,
Z-80, UNIVAC 1100,
IBM 3032, 4331, 4341,
VAX-11/780

Languages:

FORTRAN IV Plus,
Macro-11, HP Assembler,
Z-80 Assembler, BASIC,
COBOL, PASCAL

Operating Systems:

PDP-11/34 RSTS-E
VAX/VMS

and in one or more of the following applications:

- Simulation/Modeling Development
- Real-Time Scientific Programming
- Data Analysis and Evaluation
- System Test/Integration, or
- Business Systems and Applications

Bendix Field Engineering Corporation
Subsidiary of The Bendix Corporation
One Bendix Road, Columbia, MD 21045
An Equal Opportunity Employer M/F

Bendix offers competitive salaries, excellent benefits and definite advancement. Call TOLL FREE: 1-800-638-7816 (in Maryland call COLLECT: (301) 960-7502), or send your resume in confidence to Department NA03.



BancOhio
National Bank

ATM SYSTEM
DEVELOPMENT

BancOhio, recognized nationally as a leader in advanced business data processing among financial institutions, is seeking high-powered seasoned professionals to implement a major system enhancement to accommodate our charter membership in the PLUS national ATM Network.

We are interested in talking to aggressive, career-minded people who have at least 3 years of structured COBOL experience on IBM hardware. Applicants should have a demonstrated ability to develop, maintain, test, debug, document, and implement ATM applications of major complexity. Prefer working knowledge of IMS DB/DC, TSO, VSAM, MVS dump readings, and good organizational skills. Any knowledge of Series 1 hardware, Docutel or Diebold ATM's is extremely helpful.

These Programmer Analyst and Systems Analyst positions provide an excellent opportunity for professional growth and development within a highly sophisticated and advanced data processing environment which includes dual IBM 3033's, 370/158, IMS DB/DC, and CICS.

If you meet the qualifications and have the ability to communicate well with peers, users, and management I would be very interested in talking with you. In addition to an excellent salary, we offer a comprehensive benefits package and a liberal relocation assistance program. Interested and qualified candidates, please send resume and salary history, in strict confidence, to:

Jeffrey D. Russell
Technical Recruiter - ATM
155 East Broad Street
Columbus, Ohio 43265
614-463-8023
(No Agencies Please)

BancOhio
National Bank

Affirmative Action/Equal Opportunity Employer

WE CHALLENGE YOU
To Find A More
Rewarding Opportunity

Due to the rapid success of our large IBM systems software security product, ACF2 (Access Control Facility) and other development projects, SKK has several outstanding opportunities immediately available for experienced systems professionals in the following areas:

TECHNICAL SERVICE AND SUPPORT

MVS system generation and maintenance experience. Good communication skills required for customer problem resolution. Exposure to industry software products desired. Familiarity with VS1 and VM helpful.

SYSTEMS SOFTWARE DEVELOPMENT

Programmers with strong Assembler experience and working knowledge of control blocks and internal flow of MVS, VS1 and/or VM operating systems.

PRODUCT COORDINATION

Systems analyst with two years analysis and writing experience to review customer requests and to produce software product specifications. MVS, VS1 and/or VM system experience with familiarity of OS internals. Excellent oral and written communications skills are required.

SKK, a progressive leader in an innovative field, offers qualified candidates with a strong desire to further their careers, competitive salaries and comprehensive benefits in our Chicago O'Hare location. Send resume in strict confidence to:

SKK, Inc.

Suite 530
10400 W. Higgins Road
Rosemont, IL 60018
Maureen English
(312) 635-1040

An Equal Opportunity Employer

acf2™
SKK

NORTH CAROLINA

If you qualify for positions in the \$20,000 to \$40,000 range, contact us in total confidence concerning opportunities in the Carolinas. We specialize in Data Processing professional placement. Our clients pay our fees and provide relocation assistance.

ROMAC

2000 W. First Street
Winston-Salem, North Carolina 27104
919-725-1933

SYSTEMS PROGRAMMER ANALYST

The position reports to the Director of the Computer Center in a community college located 40 miles west of Chicago with a total enrollment of approximately 7,000 students. The position is responsible for the maintenance, application and documentation of all software systems and for designing administrative programs and systems.

Minimum required qualifications include at least three years of successful employment experience in at least three of the following areas: CICS, DOS/VS, DL1, COBOL, BAL and VSAM. The following are also preferred: a Bachelors Degree, PANVALET experience, and employment experience in a non-profit institution.

Twelve months salary up to a maximum of \$31,000 with fully paid fringe benefit program for employee and dependents.

Send letters of application with resume, references and transcripts to Personnel Department, Waubesa Community College, Sugar Grove, IL 60554 by September, 24th 1982. Personnel Department Waubesa Community College Sugar Grove IL 60554 an Equal Opportunity Employer

position announcements

position announcements

position announcements

position announcements

position announcements

SR. PROGRAMMER ANALYSTS

Ford Aerospace has an extensive history of technological and developmental accomplishments associated with NASA man and unmanned space missions. With the success of the space shuttle, continuing and new requirements offer challenges that are rewarding to the participants and to science. We are interested in having you join a company dedicated to professionalism and challenging assignments, especially if you have the following background.

SR. PROGRAMMER ANALYST

Four to six years experience in business systems using COBOL, large scale IBM computers, OS/MVS with IMS experience desirable. Particular applications experience in manufacturing systems is desirable.

APPLICATIONS PROGRAMMER ANALYST

Three to eight years experience in the following:

- IBM OS/MVS
- TSO
- ADF
- PL/I
- 370/168 4341 Computers

You are eligible for assignments responsible for applications design and implementation for large scale applications involving interactive and batch programs, and the collection of data relative to the Space Shuttle Mission Control Center configuration. This comprehensive and complex project will provide NASA Space Shuttle flight control with a system to plan mission command control and monitoring configurations.

We offer competitive salary and a top of the line comprehensive benefits package. Interested and qualified individuals should send resumes to: **Ken Butler, Ford Aerospace & Communications Corporation, Dept. AJC, P.O. Box 58487, Houston, Texas 77258.** We are an equal opportunity employer, m/f.



Ford Aerospace & Communications Corporation

Space Information Systems Operation

SYSTEMS ANALYST

We have the 'state-of-the-art' equipment and small town environment you're looking for. The makers of Schwan's Ice Cream and Tony's Pizza are seeking professional DP personnel to help meet the needs of our rapidly growing company. Work with large scale honeywell equipment in a comfortable, congenial and professional environment. Or present needs are for two Systems Analysts with a minimum of 6 years experience to work in our corporate headquarters in Marshall Minnesota. Contact Linda Nelson at (612) 546-2340.



Suite 148
Shelard Tower
Highway 12 & County Rd. 18
Minneapolis, MN 55426



ROMAC

FLORIDA MEET THE CHALLENGE

Florida's tremendous growth has created unique opportunities in state of the art environments for motivated, skilled data processing professionals.

PROGRAMMERS, ANALYSTS, SOFTWARE ENGINEERS, SYSTEMS PROGRAMMERS

UNLOCK YOUR POTENTIAL

Romac & Associates of Florida, Inc.

215 E. Madison Street
Tampa, FL 33602
(813) 228-6327

901 SE 17th St., Suite 210
Ft. Lauderdale, FL 33316
(305) 525-8888

EDP OPPORTUNITIES

APL expert fin'l systems \$0pen
CICS Restrict recovery, DOS/VSE
MVS conversion \$41M
MRO DOS VSE CICS, learn MVS \$40M
conversion \$40M
RSX 11-M, Macro 11, APL, LI, NY loc. \$40M
FIN'L SYSTEMS Data Base
RSX 11-M \$37M+
VSE Shared power, DOS/VSE
learn MVS \$37M
VOICE & Data line modems, multiplexes \$32M
VM/CMS Fortran, degree, \$29M
EDP Audit, no travel, audit Pak, Culpritt, \$27M
Call Bill Borrelli (212) 348-3810
WM HARRIS ASSOC.
25 Ann Street agency NY, NY 10038

ATLANTA SUNBELT & NATIONWIDE

Applications & Systems Software
Mainframe/Mini/Micro
2+ years experience

#-o-r-t-u-n-e

3400 Peachtree Rd, N.E.,
Suite 518
Atlanta, Georgia 30326
404/231-2253

Senior Systems Analyst/ Programmer

Growing Midwest Leasing Company has immediate opening for a Senior Systems Analyst/Programmer with at least 5 years experience in financial applications. Prefer experience in lease accounting. Programming experience in COBOL. Knowledge and working experience with IDMS/Data Base. Experience on DEC System 10/20 preferred. Excellent opportunity for self starter, good career potential and advancement opportunity. Excellent salary and fringe benefits. Relocation expenses. Send resume to:

Human Resources Manager
P.O. Box 268
Moberly, MO 65270.

WANT A CAREER IN ELECTRONICS?

Utilize all of your training and schooling from the military and civilian to troubleshoot and repair various computers, communications and instrumentation systems with our non-advertising clients. Full line of benefits. Nationwide locations.

CALL NOW - TOLL FREE
800-233-5371
Chicago (312) 881-1130
24 hour answering service
or send resume to:
ELECTRONIC SEARCH
2525 Oakton, Suite C-30, Dept. C
Arlington Heights, IL 60005
NO FEES/NO CONTRACTS

Plymouth State College invites applications for a position as Assistant Professor of Computer Science. We are a growing department with 3 faculty positions (5 by Sept. 83) and many interested undergraduates and we need a colleague who is interested in teaching & developing our programs & facilities. A doctorate and formal education in computer science are necessary for a tenure-track appointment. We are located at the base of New Hampshire's White Mountains, with the lakes region only 15 minutes away, making us one of the northeast's most attractive places to live and work.

Send resumes and inquiries to:
Dr. William J. Taffe
Department of Computer Science, Box F
Plymouth State College
Plymouth, NH 03284
AA/ECE

SYSTEMS SECURITY SPECIALIST

To plan, organize, implement,
evaluate Data Center security for

SOHIO Investor in Energy

SOHIO, a rapidly growing Fortune 20 corporation, is a major factor in America's energy future. Computing and communications requirements for our distributed processing environment are expanding. Because of our change and growth, we have established a position for a results-oriented professional with significant technical depth. An undergraduate degree with at least 4 years' experience in systems and software security is desired. Ideally, your practical experience includes commercial, scientific and telecommunications system architectures. Comprehensive knowledge of operating systems, programming languages and data base concepts is essential. Mini and micro computing experience would be an added plus. You must be an independent, highly motivated person with effective interpersonal skills.

As the Systems Security Specialist for SOHIO's Cleveland Data Center, your responsibilities will include:

- Security network design including hardware, software and telecommunications components.
- Security facility requirements definition, research, evaluation and implementation.
- On-going evaluation and analysis of security systems.
- Risk and vulnerability assessments.
- Advising and educating clients in the effective use of systems security facilities.

Your qualifications will be rewarded with a competitive salary, excellent benefits and ideal advancement possibilities. **SOHIO's relocation package for new hires who are homeowners includes a mortgage interest differential allowance, third party home purchase option and other features normally restricted to internal transfers.**

If you're looking for challenge and opportunity within our sophisticated Management Systems environment, start by sending your resume and salary history/requirements, in confidence to:

Sarah Steiner, Sr. Executive Recruiter
THE STANDARD OIL COMPANY (Ohio)
1424 Midland Building—434CW • Cleveland, Ohio 44115
An Equal Opportunity Employer M/F/H/V

NO THIRD PARTY INQUIRIES, PLEASE.

"Help us Help to Assure America's Energy Future"



DATA PROCESSING POSITION SENIOR PROGRAMMER ANALYST CENTRAL MAINE

We need an individual who can help us move forward into the future. We need an individual who can and will install software, lead projects, write code and interface with users. We need an individual who wants to be part of a skilled systems staff in an aggressive banking/data processing environment. We need an individual who wants to be challenged and seeks to achieve.

Excellent potential for growth.

Excellent benefit package.

Technical Environment: Banking applications, IBM 4341, DOS/VSE, CICS, COBOL.

Four years experience minimum.

Send resume or call **Peter Petros, Vice President, FBC, Edison Drive, Augusta, Maine 04330, (207) 622-6215.**

IDAHO

Idaho Power Company currently has openings for computer programmers in the Data Processing Department.

Formal training and a minimum of two years of PL/I or COBOL programming experience on IBM equipment is mandatory. Experience with 370 DOS/VSE, DL/I, VSAM, in a CICS environment considered a plus. Salary commensurate with experience.

Positions are located at the Idaho Power Company Corporate Headquarters in Boise, Idaho.

Send Resume and Salary History to:

Mr. John Dominick
IDAHO POWER COMPANY
P.O. Box 70
Boise, Idaho 83707

An Equal Opportunity Employer M/F

position announcements

position announcements

position announcements

position announcements

position announcements



Increase your assets.

Whether you are a successful professional looking for career change and growth, or a corporate executive looking for the right data processing, accounting, financial or banking professional, you meet with success when you meet us at ROMAC.

Your assets will increase with our unique and uncompromising personal and professional approach.

CONNECTICUT
140 Sherman St
Fairfield
(203) 255-9145

One Financial Plz
Hartford
(203) 525-9037

FLORIDA
201 SE 17th St
Ft. Lauderdale
(305) 525-8888

215 E. Madison St
Tampa
(813) 228-6327

GEORGIA
3340 Peachtree, NE
Atlanta
(404) 231-3535

MASSACHUSETTS
125 High St
Boston
(617) 482-6616

1 Newton Exec. Plz
Newton
(617) 968-4010

MAINE
477 Congress St
Portland
(207) 773-4749

NEW JERSEY
S-10, Rt 17
Paramus
(201) 945-7668

NEW YORK
50 Lakefront Blvd
Buffalo
(716) 853-6203

1 Marine Midland Plz
Rochester
(716) 232-4610

NORTH CAROLINA
2000 W. First St
Winston-Salem
(919) 725-1333

OHIO
11 W. First St
Dayton
(513) 461-1373

PENNSYLVANIA
1700 Market St
Philadelphia
(215) 588-6810

RHODE ISLAND
1150 New London Av
Cranston
(401) 483-7600

VIRGINIA
1800 Wilson Blvd
Arlington
(703) 525-5160

Meet with Success.

ROMAC.

Romac & Associates
Personnel Consultants



San Francisco Bay Area at it's Best

We're one of the Best EOP placement specialists in the San Francisco Bay Area. We know what companies are offering the best technology. Who's paying the best salaries. Where the best growth opportunities are.

We guarantee you personalized, professional help in matching your skills and ambitions to a career that will bring you the recognition and financial rewards you are seeking.

If you're an experienced D. P. Professional
CALL COLLECT or RUSH your resume TODAY

LOGICAL OPTIONS
One Market Plaza, Spear Tower, Suite #2014C
San Francisco, CA 94105 • (415) 777-3900



DATA PROCESSING PROFESSIONALS

Before you contact someone else about our career opportunities... Contact us directly

Our 3rd party sources for hiring are limited to just a few selected firms. By contacting us directly you will be assured of receiving confidential consideration and quick response back from us.

Career opportunities in one of the country's most advanced data centers

We are state-of-the-art now and going beyond... present equipment consists of 2 IBM 3033's, utilizing MVS, IMS, and TSO. Under IBM's Systems Network Architecture, we are running 8100s under DPPX and DPCX. Within our Process Control Network, we are running DEC PDP 11 products under RSX 11M+ with

DECNET scheduled for installation in 1982. As we continue to be innovative and increase our MIS capabilities, we have created an environment that is charged with challenges and most of all—career opportunities. Immediate opportunities are now available for the following:

SR. TECHNICAL ANALYST

- IBM 8100
- DPPX
- SNA
- Degree preferred
- 5+ years experience with at least 2 years on IBM 8100
- DPCX experience and good communication skills a plus

When you join Philip Morris U.S.A. you will be joining a growth company. Our starting salaries and benefits are among the best and our career opportunities are hard to beat.

CONFIDENTIAL CONTACT

Mail to: F.X. Gilbride, Sr. Recruiter, Dept. #110-82, Philip Morris U.S.A., P.O. Box 26603, Richmond, VA 23261.

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

PHONE: HOME _____

OFFICE _____

PRESENT JOB TITLE _____

DUTIES _____

HARDWARE EXPERIENCE _____

SOFTWARE EXPERIENCE _____

COMPUTER LANGUAGES _____

YEARS OF EXPERIENCE _____

Employing equally today...promoting equally tomorrow.

Philip Morris U.S.A.

• SYSTEMS PROGRAMMER • PROGRAMMER

The Car Leasing Division of the Hertz Corporation offers challenging opportunities in its newly created Computer Automation minicomputer group at its headquarters conveniently located near Routes 80, 287 and 280.

Group members will work with COMPUTER AUTOMATION Syta interactive minicomputers in a major total business system encompassing vehicle financing, marketing, accounting and inventory control.

Previous experience on COMPUTER AUTOMATION or DATAPOINT equipment is required.

Hertz offers a competitive starting salary, and an excellent benefits package which includes 100% tuition refund and participation in its Income Savings Plan.

Qualified candidates should send resumes and salary history to: A. Parsekian-Administrator Personnel Programs



**Car
Leasing
Division**

3 Entin Rd Parsippany, N.J. 07054
an equal opportunity employer M/F

Sr. Technical Writer

Burroughs Computer Systems Group in Pasadena is a leading designer and manufacturer of commercial computer systems. As a key contributor to Burroughs world leadership in Information Management, the Computer Systems Group offers high levels of individual recognition, mobility, and fast-paced development programs.

Selected individual will create specifications, standards, manuals and related software documentation utilizing an on-line editor system. Minimum qualifications are a Bachelors Degree with technical writing skills and computer utilization emphasized. Ability to work closely with Computer Programmers to generate software documentation, specifications & standards.

Competitive salaries and outstanding benefits are hallmarks of Burroughs CSG in Pasadena. Included are: Life, Health, Dental, and Disability insurance, a Retirement Income plan, a Stock Purchase plan, and an Educational Aid program. Please send resume to:

Professional Employment
Burroughs Computer Systems Group
Dept. CW002

460 Sierra Madre Villa
Pasadena, CA 91109

An Affirmative Action Employer M/F

Burroughs
Building on strength.

position announcements

position announcements

position announcements

position announcements

position announcements

Computing Specialist Patient-Oriented Systems Saudi Arabia \$53,000 p.a. inc.

Allied Medical Group are the British health care consultants to the 600 bed Riyadh Military Hospital and its 55 bed sister hospital at Al-Kharj which provides a full range of health care to the Armed Forces of Saudi Arabia and their dependents. It is planned that, by 1985, the main hospital will be extended by a further 300 bed extension on the Riyadh complex. In an environment where sophisticated equipment and techniques are very much in evidence computing is an essential feature of the management, control and audit of hospital activities. A network of integrated systems relating to patient and accounting-oriented applications is already operational.

We now need a senior computing professional to monitor and improve the effective use of computing facilities within the hospital. Candidates must have a relevant university degree and a minimum of seven years experience in computer-related work including responsibility for project management, or experience gained in a Senior/Consultant capacity. A period of at least three years must have been spent in patient-oriented systems.

The benefits package - one of the best in the Middle East - includes: free accommodation, medical and dental services; extensive recreational facilities; four weeks leave after every 26 weeks service; free flights to and from the Kingdom, including leave flights. This appointment is offered on a two year contract (with renewal options) and the salary, based on current exchange rates, includes a bonus of one month's salary for every twelve months completed service.

For full details, please write quoting Ref. RKH 442/CW to: Malcolm Craig, Senior Personnel Officer, Allied Medical Group, 18 Grosvenor Gardens, London, SW1W 0DZ, England.



Allied Medical Group

The Best of British Health Care in the Middle East

PROGRAMMER/ANALYSTS

THE NATIONAL FINANCE CENTER
U.S. DEPARTMENT OF AGRICULTURE

Located at Michoud in East New Orleans has permanent positions for PROGRAMMER/ANALYSTS. Salary commensurate with experience. 40 hour work week with flexible hours. Full civil service benefits and job security. Applicants must meet qualification requirements as published by the Office of Personnel Management.

Applications from employees with current U.S. civil service status are welcome. Applications may be obtained by contacting:

MISS JACKIE DARBY-MALTBIE, C.W.
PERSONNEL OFFICE
P.O. BOX 60000
NEW ORLEANS, LA 70160
(504) 255-5564

MVS OR VM SYSTEMS PROGRAMMER

THE COMPUTER COMPANY is looking for two systems software professionals to join our Technical Services staff. We require 2-5 years systems programming experience with MVS/SP, JES2, CICS, ACFT/AM, SNA, TSO, APLSV and or VM/SP along with an aggressive, results oriented attitude. In return, we provide a challenging environment, rapid growth, excellent compensation based on performance, and a benefits package including company paid life, medical, and dental insurance along with tuition refund and profit sharing. Please call or send your resume and salary history in confidence to:

Julie K. Dickinson



THE COMPUTER COMPANY

1905 Westmoreland Street, Richmond, Virginia 23230
(804) 358-2171 in Virginia Call Collect
1-800-446-3612
An Equal Opportunity Employer M/F

DATA PROCESSING SYSTEMS SOFTWARE SPECIALIST

A \$30 million publicly held D.P. software company seeks systems software specialist with 3-5 years OS/MVS internals experience.

An outstanding opportunity for a highly motivated MVS specialist to be based in Dayton, Ohio and to participate in the growth of an organization whose "product" is systems software.

Responsibilities will include customer support, product enhancement and new product development.

Compensation and relocation expenses open. Send resume to:

Mr. Glenn Miller
CGA/Allen Software
212 West National Road
Vandalia, Ohio 45377

HP 3000

SYSTEMS PROGRAMMER. HP hardware/software architecture, access methods, line control techniques, software programming in SPL. \$38K.

PROGRAMMER ANALYST. Two years plus of COBOL with experience in analysis and development process. Oil and gas a plus. \$30K.

Brooks, Brownsted & Assoc.
5757 Alpha Rd., Ste. 502
Dallas, TX 75240
214/397-3300

KANSAS CITY

We represent the finest clients in K.C. & throughout the Midwest. Outstanding opportunities exist for Programmers, Analysts, Software Programmers, Data Base Analysts and Data Communication Analysts. Salary Range \$25-40K.

6405 Metcalf Shawnee Mission, Kansas 66202 (913) 236-8288

**DATA PROCESSING
CAREERS**

DALLAS

After Dvlpmt-Banks
Programming

The thrust of the 80's will be in professional software development houses. If your career has been built on banking systems and your desire is to work on the vendor side, contact us regarding our client who is looking for your talents. To \$30K, 2720 Stemmons Frewy, 1207F Dallas, TX 75207, (214) 637-6360

**DATA PROCESSING
CAREERS**

FT. WORTH

IMS/DB
ANALYST TO \$35K

TX energy concern is expanding its DB efforts. Two plus years IMS/DB/DC exper. required. Great relocation pkg. provided including home purchase.

Suite 911 One Summit Ave Ft Worth TX 76102 (817) 336-4565

**DATA PROCESSING
CAREERS**

Administrator

Progressive southeastern growth company seeks two individuals. Administrator to run medium sized shop in IBM 4341, DOS/VSE environment. Five years DP management a must. MBA a plus. Successful candidate will possess demonstrated leadership, track record, project management, project leadership experience desirable, communications and problem resolution skills.

Systems Analyst

Three years systems analysis and design a must. Four years degree required. Successful data base DL/I. Submit resume and salary history to:

Reply to CW-A3321
Computerworld
Box 880
Framingham, MA 01701

SYSTEMS PROGRAMMERS

Work and live in the
best of both worlds ...
the San Francisco Bay Area!

Fireman's Fund Insurance Companies, a progressive, stable leader in the Insurance Industry, has exceptional opportunities AT SEVERAL LEVELS in:

• MVS

Utilizing 3 new IBM 3081's, and working with MVS/SP 1.3, IMS and distributed processing, positions support and maintain data management software, tape management software UCC-ONE, install and maintain operating system releases, and support mass storage TSO/SPF and performance tuning. Requires 3 years experience with MVS internals, SMP-4, and a working knowledge of Assembler, SPF and JES 2. Experience on a 3081 is desirable. (Please refer to Job #TS).

• CICS

Will install and maintain test and production CICS/VS systems running under VM/SP-DOS/VS on a stand alone 4341 for our growing agency interface activities. Responsibilities include tuning and/or upgrading the CICS systems as well as defining and enforcing user standards. Requires 3 years experience in a state-of-the-art CICS/VS environment; familiarity with 3270 type interactive processing and 3780 type batch processing are desirable. (Please refer to Job #AI).

Work and live in one of the most beautiful, exciting areas in the country...minutes from cosmopolitan San Francisco, superb schools and outstanding cultural programs ...or minutes from the Wine Country, Lake Tahoe or the seashore!



**FIREMAN'S FUND
INSURANCE COMPANIES**

Fireman's Fund offers professional upward mobility, competitive salaries, comprehensive benefits, excellent in-house training and an outstanding relocation program. For immediate consideration, please forward your resume, including salary history, to Professional Employment, (refer to Job #), FIREMAN'S FUND, 1600 Los Gatos Road, San Rafael, CA 94911. Individuals only apply. An equal opportunity employer.

Data Processing

ANALYST PROGRAMMER

FLORIDA ROCK INDUSTRIES, a Jacksonville, Florida based, publicly owned corporation, has a requirement for an Analyst/Programmer with 5 or more years experience, 2 of which have been in systems requirement definition, design and implementation of major business application projects in an IBM operating environment. Prior experience in the transportation industry a plus; state-of-the-art installation utilizing on-line program development and data base. Send a confidential resume, including salary history and requirements to:

Personnel
P.O. Box 4667
Jacksonville, FL 32201
an equal opportunity employer m/f

**FLORIDA ROCK
INDUSTRIES INC**

DATA PROCESSING MANAGER

Fantastic opportunity with a multi-state materials wholesaler located in Bergen County, New Jersey is looking for a D.P. Coordinator with knowledge of mini-computer processing. Must be organized and experienced in developing procedures. This take-charge individual will be responsible for setting up and maintaining an inventory management system. Please send resume to:

P.O. Box 511
East Rutherford, N.J. 07073

SYSTEMS ANALYST/PROGRAMMER

International organization in New York City seeks candidates experienced in systems analysis and programming to assist in the design and development of complex computer systems. Applicant should possess a university degree in Computer Science, Business or other related fields. A minimum of five years experience using COBOL, CICS and DL/I is required and at least one year should be at the analyst level, knowledge of PL/I, VOLJE, MARK IV and some experience with financial systems desirable; demonstrated capability to deliver and work effectively in a team environment. Added experiences will be compensated for.

Excellent remuneration and benefits package, including six weeks annual leave. Applications should refer to VA922/82 and should be addressed to:

Reply to CW-A325
Computerworld
Box 880
Framingham, MA 01701



position announcements

position announcements

position announcements

position announcements

position announcements

PROGRAMMING OPPORTUNITIES

TRW Operations Support Group has the following career opportunities in its Financial and Data Services Division:

CDC Systems Programmer

Small project group needs an independent assembly language programmer with initiative to develop and maintain TRW/TSS software. Position requires a minimum BS, 3 years assembly language programming and a thorough knowledge of operating systems principles.

UNIX Systems Programmer

Highly skilled C language programmer needed to develop and maintain such software tools as office automation aids and document formatters for a UNIX system. Position requires a minimum BS, 3 years C language programming and extensive knowledge of the UNIX system.

IMS Systems Programmer

Implement and maintain IBM's IMS in a shared DASD multi 303X environment which supports an extensive 3270 network. Requires at least 3 years IMS internals experience. Knowledge of SMP, VTAM, and VSAM desirable.

TRW offers excellent salaries and an outstanding flexible benefits plan which includes medical/dental/vision care.

Send resume in confidence to:

R.D. Chambers
TRW Financial & Data Services Division
Bldg. E1/4029
One Space Park
Redondo Beach, CA 90278

Equal Opportunity Employer
U.S. Citizenship Required

EDP/MIS Professionals New England/East Coast/ Nationwide

Robert Kleven and Co., Inc. has a wide variety of positions available in **Programming, Systems Analysis/Design, Data Base Applications, Applications Programming and Software Support** for professionals well versed in the field. If your experience covers one or more of the following areas, contact us: Technical Support: **COBOL/IMS/CICS/DOS/OS/VS/VM/MVS** Programming/Design. Assembly or Higher Level Language. Programming. Data Base Design/Utilization. Hardware and Software Technical Writing.

We've been providing Confidential and Industry-Knowledgeable placement for MIS professionals since 1969. We can also provide you with free resume preparation and career path counseling. Client companies assume all fees. Contact: **Simone Zani**.

Robert Kleven and Co., Inc.
INDUSTRIAL RELATIONS MANAGEMENT CONSULTANTS
181 Bedford Street, Lexington, Massachusetts 02173
Telephone (617) 861-1020

Member
Massachusetts Professional Placement Consultants
National Computer Associates
Offices Nationwide
Representing Equal Opportunity Employers M/F

EMPLOYMENT SERVICE FOR PROGRAMMERS AND ANALYSTS

National Openings With Client Companies
and Through Affiliated Agencies

Scientific and commercial applications • Software development and systems programming • Telecommunications • Control systems • Computer engineering • Computer marketing and support

Call or send resume or rough notes of objectives, salary, location restrictions, education and experience (including computers, models, operating systems and languages) to either one of our locations. Our client companies pay all of our fees. We guide you decide.

RSVP SERVICES, Dept. C
Suite 700 One Cherry Hill Mall
P.O. Box 5013
Cherry Hill, New Jersey 08034
(609) 667-4488

RSVP SERVICES, Dept. C
Suite 211 Dublin Hall
1777 Walton Road
Blue Bell, Penna 19422
(215) 629-0595

RSVP SERVICES

Employment Agents for Computer Professionals

Computer

R & D Opportunities Austin, Texas

The Austin Research Center is dedicated to the fullest possible exploitation of advanced software and integrated circuit technology in information systems of radical design. Encouraging developments at the center have created several openings.

The ideal candidate for one of these openings:

- prefers the excitement of discovery to the comfort of routine.
- shows initiative in recognizing problems, isolating issues, and setting goals.
- has a broad systems design background.
- values simplicity and soundness of design.
- works well independently, yet willingly subjects work to peer review.
- in cooperative efforts, accepts either leadership or subordinate roles as circumstances dictate.
- believes in the importance of effective expression.

Distributed Systems

The candidate should be able to define and implement communication protocols, language interpreters, or database inquiry and reporting tools for systems comprising distributed, loosely coupled, components. Experience in one or more of these areas is required.

Database Systems

Or, the candidate should be able to work on the design and implementation of an advanced database management system for use in a distributed system environment. Experience with implementing database systems is desirable.

The above positions require a BS or MS in Computer Science or Electrical Engineering (or equivalent experience).

The benefits at Burroughs are competitive and comprehensive, and include life, health, dental and disability insurance, stock purchase plan, retirement plan, and educational aid program.

If you qualify for any of these positions, please send your resume to:

Pam B. Shumaker
Burroughs Corporation
Dept. CW-913
12201 Technology Blvd.
Austin, Texas 78759

An affirmative action employer, M/F.

Burroughs

Building on strength.

SYSTEMS ANALYSTS AND PROGRAMMERS FOR SUNBELT LOCATIONS

Job dissatisfaction, complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals. Every day new career opportunities pass us by because we are unaware of their existence. Let us keep you abreast of what your true value is in the market place. Absolutely no obligations, please call or write Keith Reichle, CPC, Data Processing Specialist.

Dunhill

OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28211
800-438-2012
(NC Call)
(704) 542-0912

COMMUNICATIONS SYSTEMS PLANNER TO 34K

Fortune 500 client seeks min. 3 yrs. exp in Communication Network Design, Sys Design, DDP, TeleCom access methods such as VTAM, BTAM, and JES; and on-line systems such as CICS. Qualified candidate will plan for corp. DataCom needs & analyze the direction & impact of DataCom systems. PAID RELO. Excellent benefits.

Contact: BOB GREENBERG

McFadden
811 Church Road
Suite 214
Cherry Hill, NJ 08002
(609) 488-0500
(215) 588-3648

*Want to move to
Upstate New York?*



We're the people to see.

From Buffalo to Albany, from Binghamton to Massena, we're the computer and accounting/financial pros who place the computer and accounting/financial pros. That's what we're known for—and we do it with care, personalism and confidentiality. Contact us first!

ALL FEES EMPLOYER PAID



Associates
PERSONNEL INC.



2530 JAMES ST.
SYRACUSE, NEW YORK 13206
PHONE: (315) 463-5225

SPECIALIZED AFFILIATES NATIONWIDE
National Computer Associates (NCA) & Accounting Financial Associates (AFA)

position announcements

position announcements

position announcements

position announcements

position announcements

SYSTEMS ANALYST

Carry out a wide range of projects in the Real Estate Department of Manufacturer's Hanover.

Broadened professional responsibility in a dynamic, advanced DP environment is the key attraction of this exceptional career opportunity. Our department develops and administers real estate-related loans, coordinating its activities with various divisions of the bank.

Interfacing with all levels of personnel from various inter-related areas, you'll analyze both current and proposed systems to ensure that software and hardware meet bank standards and allow for future expansion. This will involve systems feasibility studies, specifications, tests, usage guide-lines and documentation.

Our state-of-the-art environment features DEC 20, Wang Word Processing IOS 140, Nixdorf 8870-3 and various time sharing equipment.

You must be able to provide systems expertise and technical assistance during both long-range and immediate research, development, enhancement, implementation and maintenance projects. The ability to clearly present recommendations to management is vital.

At least 2-3 years related systems experience is required, with knowledge of project life cycles, time sharing, CICS, COBOL, BASIC and FORTRAN. Some familiarity with finance and accounting on a practical level is also necessary. A college degree with emphasis on Mathematics, Accounting or Computer Science is required.

Salary will be commensurate with background, excellent benefits include tuition reimbursement and we offer outstanding potential for advancement. Apply by sending resume with salary history, in confidence, to: Paul Antony, Professional Recruiter,

MANUFACTURERS HANOVER TRUST

350 Park Avenue, New York, NY 10022

An Equal Opportunity Employer M/F

SYSTEMS ANALYST

SYSTEMS ANALYST ACP/PARS

To provide consulting services to Airlines, Hotels, and other ACP/PARS users. Analyze existing business procedures, data handling systems and problems to evaluate effectiveness. Conduct special studies and investigations to develop new, improved information systems to meet current and projected needs of clients.

40 hours week, 8:30-5, M-F, \$2500/mo, 2 yrs. college in Computer Science or Math, 4 years experience.

Resumes to:

DenCom
1602 S. Parker Rd. #312
Denver, CO 80231
ATTN: Personnel

SYSTEMS ANALYST. Design & implement computer systems related to financial institutions. Maintenance & enhancement of these systems, & provide vital skills which ensure their successful & cost effective operation. Bach. degree or equiv. in ComSci/Math/Physics. Must have knowledge of COBOL. 2 yrs or 2 yrs in programming. \$538.50 per wk to work 35 hrs/5 days/wk. PLEASE SEND RESUMES TO: Atlantic Information Systems, Inc. 575 Madison Ave. Ste. 1006 NYC 10022.

DIRECTOR OF ENGINEERING Rapidly Growing Computer Graphics Software Company

Position demands proven line management experience directing major commercial software projects in a large corporation. Technical degree, preferably computer science, and MBA desired. Must have record of on-time, on-budget performance. Right candidate will thrive in high growth, entrepreneurial environment. Please send resume, references and other data in confidence to:

Precision Visuals Inc.
250 Arapahoe Ave.
Boulder, CO 80302
EOE/AA Employer

Northern California

Sacramento & the Central Valley are undergoing tremendous EDP industry growth. Fantastic career opportunities are currently available for system programmers. Application programmers with exp. on HP, IBM, PDP/VAX (DEC) & other mini-systems are in immediate demand as well.

For prompt consideration send resume & salary history to:

Dean, Parke, Williams
& associates
P.O. Box 60654, Sacramento, CA 95860
(916) 972-1202
(fee paid)

DP PROFESSIONALS San Francisco

The information explosion has created an unusually good opportunity for skilled talents to contribute to application systems development. Let us explore a career match for you with our clients.

INDUSTRIES

Classical and Process Manufacturing; Retail; Distribution; Banking.

ENVIRONMENTS:

IBM S/370 Model 135 through 3033; DOS/VS, OS/VS, DBMS, Communications, Interactive, Computing, COBOL, PL/I, ALC.

JOB TYPES:

Programmers, Analysts, Project Leaders, Systems Programmers, Data Base Analysts.

We are consultants to management. For immediate and confidential consideration, please send detailed resume to:

Reply to CW-A3323
Computerworld
Box 880
Framingham, MA 01701

Employer assumes fee.

"NATIONWIDE" Recruiting & Search COMMUNICATIONS & DATA PROCESSING

COMMUNICATIONS:
Data Comm. Analyst 30K
Data Network Planner 45K
Software Comm. Prog. 45K
Voice Analyst 35K
Telecomm. Sales 30K
Regional Sales Mgr. 45K+

DATA PROCESSING:
Sr. Systems Prog. 40K
Tech Support Mgr. 45K
System Prog. 45K
D.B.A. - IMS/DBDC 40K
Prog. Anal. Mfg/Fin 38K
Prog. Anal. Banking 35K

CALL OR WRITE: 714-754-0198

o-r-t-u-n-e
PERSONNEL CONSULTANTS
17744 Skypark Circle, Suite 200
Irvine, CA 92714

Systems Programmer. Resp. for the design, development & maintenance of specialized software for the support of communications networks to allow the interchange of data between computers, & related duties. Requires B.S. Computer Science, E.E., Math. or Equivalent & 6 years Operating Systems Development exp. Also requires exp. in leading the development of a software subsystem; expertise in teleprocessing. Salary: \$50K. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O. # 2699141. Ad paid by An Equal Opportunity Employer. Job site: Dallas, TX.

POSITION WANTED

OPERATIONS/MANUFACTURING/ GENERAL MANAGEMENT

19 yrs. senior management experience in lg. & sm. companies in the Electronics Industry. Products include: control & monitoring devices, microwave components, computer peripherals, word processing, and service. Successful in start-up, turn-around, & ongoing operations. Definite achiever. Available immediately.

Reply to CW-A3309
Computerworld
Box 880
Framingham, MA 01701

COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- TIME & SERVICES
- SOFTWARE FOR SALE
- REAL ESTATE
- BUSINESS OPPORTUNITIES

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or a camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (teletype service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

**Ad closing is every Friday,
6 working days prior to issue date.**

Rates: Open rate is 97.30 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs \$194.60 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4" - 389.20
2 cols x 4" - 778.40
2 cols x 5" - 973.00
2 cols x 8" - 1556.80

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available. \$10 per insertion. Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday)

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
New York - (201) 867-1350
Chicago - (312) 827-4433
San Francisco - (415) 421-7330
Los Angeles - (714) 556-6480

TELECOPIER SERVICE - (617) 879-0700

William J. Mills, Manager Classified
Advertising



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-0700

BUY•SELL•SWAP

DPD
PERIPHERALS
3330 3410
3340 3411
3350 3420
BUY • SELL • LEASE

COMPUTER
BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TENNESSEE

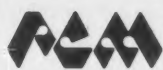


901-372-2622

GSD
SYSTEMS

3 32
34 38

BUY • SELL • LEASE



Pioneer Computer Marketing
214/385-0354

BUY-SELL LEASE

- All IBM Systems
- Peripherals
- Tapes
- Disks

SERIES/1

- Systems
- Features
- Peripherals

SYSTEM 34

- CPU
- Peripherals
- Upgrades

PIONEER COMPUTER
MARKETING
Suite 680 4835 LBJ Frwy.
Dallas, Texas 75234
214/385-0354

THE HARDWAREHOUSE IS HARD TO BEAT FOR PRICE AND AVAILABILITY.



CALL US TODAY AT (602) 248-6848, PHOENIX, ARIZONA
OR CALL OUR LOCAL OFFICE IN YOUR AREA

Boston: Eastern Regional Headquarters (617) 272-8110
Washington, D.C. (703) 521-0300
New York (212) 832-2622
Philadelphia (215) 293-0546
Syracuse (315) 682-6120

San Francisco: Western Regional Headquarters (415) 283-8980
Los Angeles (213) 670-7994
Denver (303) 534-7436
San Diego (714) 231-2361
Seattle (206) 447-1682
Phoenix (602) 248-5978
Portland (503) 228-7033
Salt Lake City (801) 298-4281

Chicago: Central Regional Headquarters (312) 789-9100
Pittsburgh (412) 922-8920
Detroit (313) 995-8717

Austin: Southern Regional Headquarters (512) 451-0121
Atlanta (404) 768-6535
Dallas (214) 233-1818
Houston (713) 629-4440

Canada: Toronto (416) 366-1513
Montreal (514) 281-1925



GREYHOUND COMPUTER CORPORATION

SUBSIDIARY OF THE GREYHOUND CORPORATION
800-528-6113

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

IF YOU GOT AN S/38 IN '82, CALL US BY 10/31.

In computer financing, it pays to go by the numbers. Because if the numbers are right, you can save a bundle.

That's especially true if you've ordered or installed a new IBM® System 38 (Model 5 or 7) in 1982. By shifting your lease to Computer Options, you can benefit from a substantially lower monthly lease rate than you'll get from IBM Credit Corp. And if you wish, you can keep the investment tax credit and depreciation write-off for yourself... something IBM won't let you do.

To find out more, call us. But remember, the new lease on your installed system must be signed by October 31—or your chance to save will be 866.

Call toll-free

1-800-328-5718

(in Minnesota, (612) 544-8660)



Computer Options, Inc.
"the best option"
1660 South Highway 100
Minneapolis, Minnesota 55416

©1982 Computer Options, Inc.

*IBM is a registered trademark of International Business Machines.

DEC DEALS!

1124A-XX
...\$4,450
11X44-CA\$20,950
BC06S-15...\$ 450
DD11-DR...\$ 400
DMCH-MD...\$ 1,100
DZ11-E...\$ 3,750
FPI1-A...\$ 1,750
FPI1-F...\$ 2,100
H960-CA...\$ 950
H960Z...\$ 1,295

CURRENT SPECIAL
RMO3-BA (used)
\$8,950.

MS11-MR...\$1,795
RK07-PA...\$4,375
RK711-PA...\$ 9,175
RLO1-AK...\$ 1,250
RL11-AK...\$2,600
RLO2K-DC...\$ 145
RMO3-AA...\$ 7,450
RMO3-C...\$ 1,775
RX211-BA...\$ 1,750
VT00-AA...\$ 1,375

READY FOR IMMEDIATE DELIVERY
We want to **BUY** equipment **NOW!** Please call about your available equipment.

The "NYCE" source... new york computer exchange, inc.

130 gozto boulevard
homingdale, ny 11735

(516) 752-8666 (212) 843-5551



Magnuson Computer Systems M80 Series

For Lease or Purchase

According to Datapro's latest survey, Magnuson has outperformed comparable IBM equipment in the areas of reliability, service and operation. Fully upgradable and supported by Magnuson Computer Systems, these units are being offered at competitive prices with immediate delivery.

Call: Kirby Fiegel
(415) 383-9700

IMMEDIATE AVAILABILITY IBM 370/148

- Model K (2 meg)
- 3047 Motor Generator
- ISC
- Will sublease at \$750 per month
- Will consider sale

Contact:
• Kent Barnes
• Bob Sipherd
GRAND CENTRAL, INC.
Salt Lake City, Ut
(800) 453-7458
(801) 486-7611

5291

FOR SALE OR LEASE
AVAILABLE 9/82
**NF COMPUTER
SALES &
LEASING CORP.**
950 YORK RD
HINSDALE IL 60521
312-920-8181
CALL KAY LEWIS

3705

Buy, Sell, Lease

Call Bob Irish

(612) 884-3366

Centron-DPL Company



BUY, SELL, LEASE 5120

4300's/3 S/38, S/1

Call Collect:
404-252-7480



DATAMARC
6065 Roswell Rd
Atlanta, GA 30328

All IBM Peripherals

AUSTRALIA

System House seeks software packages for resale

CONTACT

Ian Hopkins
Hopkins Noble Pty Ltd
24 Albert Road
SOUTH MELBOURNE,
AUST., 3205
Phone: 03 690 6877
Telex: AA37794

IBM Computer cables FAST!

CABLE xpress

(315) 476-3000

*** DEC ***

BUY—SELL—LEASE—TRADE—CONSIGN

— CPU'S —

11/23 11/34A 11/44 11/45 11/70 11/750

— DISCS —

RK05 RLO1 RLO2 RM02 RM03
RP04 RP05 RP06 RK06 RK07

— TAPES —

TM11EA TE16 TWE16 TJU45 TU45

— MEMORY —

11/34 11/44 11/45 11/70 VAX
MS11JP MS11MB MM11UP MJ11BE MS750
MS11LB MF11UP MK11BE MS780
MS11LD MK11CE

— MISC. —

FP11A FP11B FP11C FP11E FP780
DMC11AL DMC11AR DMC11MD DMC11DA DMR11
DJ11AA DJ11AC DH11AA DH11AD DQ11
DV11 DZ11 DU11 DL11 DR11
RH780 RH70 RH11 KK11 RK611

THOUSANDS OF MODULES IN STOCK
SPARE FOR ANY DEC UNIT
CALL FOR QUOTE



NATIONAL COMPUTER
EXCHANGE



800-854-7224

6980 Aragon Circle, Suite 5 • Buena Park, CA 90620

(In Calif.) 714-522-1870

TWX: 910-596-1499

DEC

SWA South West Automation

DEC

BUY, SELL, LEASE, TRADE

11/03-23-24-34-44-70

Systems-Peripherals-Modules
Maintenance-On Call Or Contract
Time Sharing, A/P, A/R, GL, INV, Payroll, WP
11381 Meadowglen, Suite E
Houston, TX 77082
(713) 497-4467

ANY TERM LEASE

3033N8

AVAILABLE NOW

CALL

CHARLIE ALBRIGHT

(212) 742-2241

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 506 Robert E. Lee Building, Jackson, MS 39201 for the following data processing equipment and services:
Request for Proposal Number 769, due 3:30 P.M., Wednesday, October 6, 1982, for the acquisition of a 32-bit scientific/research super microcomputer system and nine graphic terminals and a printer/plotter compatible with the computer.
Request for Information Number 770, due 3:30 P.M., Tuesday, October 5, 1982, for the purpose of determining the availability of software related to the daily operations of a Student Loan Guarantee Agency.
Request for Proposal Number 771, due 3:30 P.M., Tuesday, October 19, 1982, for the acquisition of a computer system with RJE, data entry, word processing, TSO, and CICS to function as an SNA node communicating with an Arndahl V6-II/Arndahl V8 running under MVS.
Request for Proposal Number 772, due 3:30 P.M., Thursday, October 21, 1982, for the acquisition of a computer system with RJE, data entry, word processing, TSO, and CICS to function as an SNA node communicating with an Arndahl V6-II/Arndahl V8 running under MVS.
Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.
Becky Adams or Carolyn Smith, State Central Data Processing Authority
801/981-4300

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

BUY
SELL • LEASE**DISK**3340 • 3344
3350 • 3380**TAPE**3411 • 3410
3420Call Bob Ford
or Nelson Johnson**S/38****S/34****S/3****SERIES/1**Call Gayle Drotar
Roger Odom
Ken Winzen
John Bottom**370 Systems**4341 • 4331
3031 • 3032
3033 • 3081Call Jack Harvey
or Larry Nesbit**NEED TO REDUCE
EXPENSES?****ECONOCOM'S
PURCHASE-LEASEBACK
PROGRAM CAN PRODUCE
IMMEDIATE SAVINGS ON
YOUR PRESENT
EQUIPMENT—CALL FOR
DETAILS.****ECONOCOM**
1755 Lynnfield Road
P.O. Box 17825
Memphis, Tennessee 38117
901-767-9130SAVE 10 TO 24%
OFF MLC**SPECIAL
LEASE RATES
ON NEW
SYSTEM/38s**

- MODEL 5 & MODEL 7 ONLY
- OPTION TO RENEW—MO./MO.
- OPTION TO PURCHASE (FIXED)
- SYSTEM MUST BE INSTALLED
NOT LATER THAN 8-31-82

CALL FOR DETAILS:
901-767-9130**ECONOCOM**
P.O. Box 17825 / 1755 Lynnfield Road
Memphis, Tennessee 38117-0825**Your First Choice** ☒
In The Second Market**IBM PROCESSORS**

- ☐ **3081** Available Now (D/K's) Will Lease/Finance Yours Or Ours.
- ☐ **3083** [E/B/J's] Will Lease/Finance Yours Or Ours.
- ☐ **3033** Available Now (N/U/AP's) Short Term Leases
- ☐ **3032** Available Now Sale/Short Term Leases
- ☐ **3031** Available Now Sale/Short Term Leases
- ☐ **4341** Buy/Sell/Lease
- ☐ **All 370's** Immediate Availability Sale/Month-To-Month Leases
- ☐ **Amdahl** Short Term Subleases Available
- ☐ **Memory/Channels** For All Models Immediately Available

IBM PERIPHERALS

- ☐ **3880-1/3830-2** Immediate Availability
- ☐ **3350/70/75** Immediate Availability
- ☐ **3880-2/3880-3** 30-45 Day Availability
- ☐ **3380 A4/AA4 3380 B4** 30-45 Day Availability
- ☐ **3330/40/44** Immediate Availability
- ☐ **3803-1/2 and all models of 3420's** Immediate Availability
- ☐ **3705/04** Call Karen Johns
- ☐ **327X CRTS** Call John Christopher 312-698-3000

We Can Put It Together

Eastern Regional Headquarters
(Connecticut) 203-655-1211
Boston 617-542-4005
New Jersey 201-568-9666
Philadelphia 215-545-8035
Washington, D.C. 301-441-1000

Midwestern Regional Headquarters
(Chicago) 312-698-3000
Michigan 313-644-1500

Western Regional Headquarters
(San Francisco) 415-944-1111

South Central Regional Headquarters
(Dallas) 214-258-6444
Fort Worth 817-534-1774
Atlanta 404-256-5956
Florida 305-428-3177

Canadian Regional Headquarters
(Toronto) 416-968-1135

International Headquarters
(Chicago) 312-698-3000
Latin America 305-666-6258
Paris (1)524 5270
Switzerland (21)71 09 35
West Germany (2434) 5048

Corporate Headquarters
6400 Shafer Court 312-698-3000
Rosemont, IL 60018 TWX 910-253-1233



A MEMBER OF CDLA AND LISTED ON THE NEW YORK STOCK EXCHANGE

COMPUCOM**BUY-SELL-TRADE**PDP8 • PDP10 • PDP11
PDP15 • DEC20 • VAX
AND COMPONENTS

COMPUCOM INC.

3404 OAKCLIFF RD., C-4 ATLANTA, GEORGIA 30340
(404) 452-1090 / TWX 810-757-02023083
4341
4331Controllers
3880 3830
3803Control Units
3274 3272
3276 32714341-K1 (used)
will reconfigure to
L1 or L2
Available 11/1/82
Sale / LeaseDASD
3380 3375 3370
3350 3344 3340
3330 3310We Buy, Sell & Lease
IBM Processors and
Peripheral EquipmentTape Drives
3420
3410 8809Printers
3203 3211
14033287 3289
Immediate DeliveryDisplay Stations
3278 3277
Immediate Delivery

Contact Bernie Gest 215-782-1010

Computer Marketing Inc.

7704 Seminole Ave., Philadelphia PA 19126



buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

Lease • Purchase Sell

IBM SYSTEMS & PERIPHERALS

4331 --- 4341
SYSTEM 38

612-941-0510

WINTHROP

FINANCIAL CORPORATION

computer sales & leasing division

6400 Flying Cloud Drive • Eden Prairie, Minnesota 55344 • 612/941-0510

EQUIPMENT AVAILABLE

Description	For Sale/Lease	Date
370/168		
3168 - U34 (2150, 2151, 3855, 4650, 6111, 7850, 7905, 3066-2 and 3067-3)	Lease Only	Now
3168 - U32 (2150, 2151, 2152, 3623, 3855, 4650, 6111, 7850, 3066-2, 3067-3, 2860-2, 2870-1, 2880-2)	Lease Only	Now
3168 - KJ (1435, 3855, 3066-2, 3067-2, 2-2870's, 3-2880's)	Lease Only	Now
370/158		
3158 - U85 (1433, 1434, 1435, 7840, 3213-1)	Lease Only	Now
3158 - U34 (1433, 1434, 1435, 2150, 2151, 4650, 7840, 4450, 3213-1)	Sale or Lease	Now
3158 - JI (1433, 1434, 7840, 3213-1)	Lease Only	Now
3158 - J (1433, 1434, 1435, 4650, 7840, 7905, 3213-1)	Lease Only	Now
3042		
3042 - 2	Lease Only	Now

215/964-2000

LFC

Contact: Jack Northrop
Lease Financing Corporation
3 Radnor Corporate Center
100 Malsonford Road
Radnor, Pa. 19087
'215/964-2000

COLA

Member
Computer Dealers
& Lessors Association

SUPER SUMMER SPECIALS

AVAILABLE FROM STOCK!

Call **DATELEASE 800-854-0350**

ALL EQUIPMENT FOR SALE OR LEASE

"The DEC Specialists"

OPTIONS

- FP11A \$1,700
- FP11P 2,500
- KT24 7,500
- BAT1KE 800
- DD11OK 2,800
- DD11OK 750

COMMUNICATIONS

- DZ11A \$2,200
- DZ11B 1,800
- DZ11C 2,400
- DZ11E 3,499
- DMC11AL 2,200
- DMC11MA 2,350

C.P.U.S.

- 11/23 PLUS \$ 7,995
- 11/24-BC 11,450
- 11/34-A 9,999
- 11X44-CA 22,500
- 11/70AA 69,500

DISKS

- RLO2AK
- RMO2AA
- RMO3AA
- RPO6AA
- RK07AA

TERMINALS

- VT100 \$1,325
- VT101 995
- VT125 995
- VT131 1,425
- LA39 999
- LA100 1,899
- LA120 1,995

PERSONAL COMPUTER OPTION VT18X

SALE \$1,295

DATELEASE 2770 East Regal Park Drive, Anaheim, CA 92806 in California call: 714/632-5986 or 408/287-7338

INVENTORY CLEARENCE SALE

DEC VT100-AA	\$1295
DEC LA120-AA	\$1895
DEC LA120-RA	\$1695

All other DEC terminals in stock.

Computer Systems Corporation

5540 Rock Hampton Court
Indianapolis, IN 46268
(317) 872-7200

FOR SALE HONEYWELL L-62 System

C Processor
224K Memory
(5) MSU310 Disk Drives
300 LPM Printer
Card Reader
Contact Mike Hollen
(415)968-1390
Mountainview, CA

COMPUTER AIR CONDITIONERS

Company Going Out Of Business
3 Liebart MM18A
1 1/2 Tons, 16000 BTU's
All Units Less Than 1 Year Old
Each Unit \$1500
Call or Write
First Byte
2192 Martin St., Ste. 155
Irvine, CA 92715
(714) 955-2540

1 Year 2 Year 3 Year Lease

3330-S8	Now
3033-N8	Now
3033-U16	10/1/82
3033-U8	11/1/82
3850 For 3033U	Now
3420-6	Now
3033 U12 To U16 Memory	Now
3803-2 With 1792-8100	Now

Call:
Charlie Albright

Sha-Li Leasing Associates

(212) 742-2241
39 Broadway
New York, NY 10006



**DEC
2060 SYSTEM
FOR SALE**
C. D. SMITH &
ASSOCIATES, INC.
(713) 578-8464

IBM

3270

PRINTERS, TERMINALS
& CONTROLLERS

Please Call: (312) 943-3770
Forsythe/McArthur Associates,
Inc.
919 North Michigan Avenue
Chicago, Illinois 60611

RESULTS

Whether you're buying,
selling, swapping, hiring
or looking,
you get results from
Computerworld classifieds.

Maybe that's why Computerworld
gets more classified advertising
than all the other computer
publications put together!

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

BUY SELL
IBMSERIES/1
5110-5120
S/32
S/34
S/38
S/3**ALL MODELS**
SYSTEMS AND PERIPHERALS
AVAILABLE NOW!

(408)425-7333

SOURCE
DATA PRODUCTS, INC.
555 SOQUEL AVENUE SANTA CRUZ, CA 95060Alternative
wang

Specialists

WORD PROCESSORS DIS COMPUTER SYSTEMS

SYSTEMS & PERIPHERALS

- BOUGHT
- SOLD
- SERVICE
- UPGRADES
- TRADE-INS
- LEASES

and we're faster!!!

CRCFR ASSOCIATES, INC.
18 GRANITE STREET
HAVERHILL, MA 01830**DEC****SYSTEMS & COMPONENTS**

C.D. SMITH & ASSOCIATES, INC.

12605 E. Freeway,
Suite 318
Houston, TX 77015

(713) 578-8464

TELEX 76-2547 CDSMITH HOU

**PRIME
COMPUTER USERS**New 80 and 300 megabyte drives
Available for immediate delivery.
300/1440 LPM Printers
also available.Nationwide CDC maintenance
and financing.Call Barry Dacks
Timesharing Services Inc.
(904)396-7068

HOW TO SAVE \$30,000 PER MONTH ON A 3083 LEASE.

Lease the same 3083 that IBM leases for over \$92,000 per month from Randolph—for less than \$62,000 per month. That adds up to savings of \$1,440,000 over a four-year lease period. If you're renting an older machine, Randolph may save you even more—and you'll get about four times the throughput in the bargain.

WHEN IS THE BEST TIME TO TALK TO RANDOLPH ABOUT LEASING A 3083?

Now—because Randolph has 3083's available for 4th quarter delivery. But it's never too late, even if you already have a machine installed. Whatever your situation, we can tailor a lease that will fit your exact needs and let you start saving money right away.

TALK TO RANDOLPH NOW.

We can solve problems like these, and more...

Stuck with a lease on your old machine?

We'll sublease it, and provide a new lease on a 3083.

Own a 3083 but need cash?

Sell your machine to Randolph, and we'll lease it back to you.

Machine installed on a rental basis? We'll show you how to end the lease and install a new 3083. Any termination charges can be folded into your new Randolph 3083 lease.

LEASING COMPUTERS IS OUR ONLY BUSINESS.

At Randolph, our people have an average of 18 years in the DP industry... from 360's to 3081's. They know all about alternative financing to be sure, but they also know their way around a DP department and the hardware in it.

WE LEASE MORE THAN 3083's.

Whatever your needs, now is the time to talk to Randolph. We provide leases for IBM 303X, 4300 and 3081 systems and peripherals—disks, tapes—as well as 3083's.

UNIQUE FINANCIAL STABILITY.

We're an important part of one of the nation's oldest and leading financial institutions... The First National Bank of Boston, 18 years in computer leasing gives added assurance that Randolph will continue as the leader in the computer leasing industry... continue to live up to the terms and conditions of our agreements... provide upgrades... fulfill all of our commitments.

LET RANDOLPH HELP YOU SAVE \$30,000 PER MONTH.

We can solve a lot of problems for you, and save you money, too. Talk to Randolph now... call Joseph B. Kelly, Jr., Senior Vice President, 800-243-5307.

537 Steamboat Road
Greenwich, Connecticut 06830
203 661-4200 • 800 243-5307

RandolphTHE FIRST NATIONAL BANK OF BOSTON
BANK OF BOSTONA MEMBER OF COMPUTER DEALERS & LESSORS ASSOCIATION **RANDOLPH COMPUTER CORPORATION** A subsidiary of**IBM****PROCESSORS
PERIPHERALS**

- BUY
- SELL
- LEASE

Carlyn Computer Systems, Inc.
5203 Leesburg Pike, Suite 1204
Falls Church, Virginia 22041

Call Collect (703) 820-3754

Computer Sales & Leasing

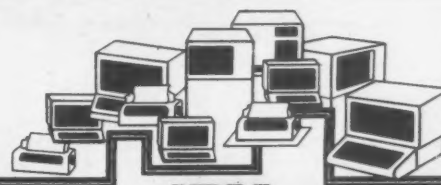
AMERICAN SOCIETY OF
COMPUTER
DEALERS

CCSI

SYSTEM
38•34•32•3**5110•5120****SERIES 1**

5251	3262
5256	3287
5211	3276

3344	3741
3411	3410
3340	029/129

**IBM****SERIES 1 S/32 S/34 S/38
TAPE DISK PERIPHERALS
UNIT RECORD 029-129
5110-5120 3741 3742****Ameritex
Computer Corporation****214-934-9151
GENE NICHOLL**

14229 PROTON • DALLAS, TEXAS 75234

AMERICAN SOCIETY OF
COMPUTER
DEALERS

buy sell swap	buy sell swap	buy sell swap	buy sell swap	buy sell swap
---------------	---------------	---------------	---------------	---------------

1-800-328-7000

In Minnesota (612) 894-4020

Your DEC Hot Line to the lowest prices nationwide!



MIDWEST SYSTEMS, INC.

12117 Riverwood Drive, Burnsville, Minnesota 55337



Want to Buy, Sell or Lease?
Or just upgrade your present equipment?

JUDY, MARILYN AND DEBBIE
WILL SAVE YOU MONEY

Call **214-258-0541** Today!

System/32s, 34s, 38s, 4300s,
3270s, 370s, all peripherals and I/O... much more!

METROPLEX COMPUTER COMPANY, INC.
320 Decker Drive • Suite 180 • Irving, TX 75062 TWX 910-860-9285

BUY	SELL	LEASE
-----	------	-------

3741/3742 S/34

800-422-1004

IN TENNESSEE CALL (615) 859-3872



Tennecom

MARKETING INCORPORATED

P.O. BOX 248 GOODLETTVILLE (NASHVILLE) TENNESSEE 37072

BUY...SELL...LEASE

IBM SYSTEM/34

Save up to **40%**

F37 E35 5251 CRT's
D34 C23 5256; 5211

Fraxions

EQUIPMENT CORPORATION
(212)279-0069

NEW CDC DISK PACKS

—“CDC Lifetime Guarantee”—

1204 • Phoenix • From \$175.00 ea.
877 • 80 MB • From \$365.00 ea.
(IBM 3330-11 Series) 882 • 200 MB • From \$525.00 ea.
883-91 • 300 MB • From \$805.00 ea.

BAC - TECH SYSTEMS, INC. 212-544-6479

Also Racal - Vadic and new printer ribbons - Call for prices.

<p>FOR SALE</p> <p>1 each BRAGEN (CDC) DISK DRIVE/CONTROLLER MODEL NO. DSC-302-6C</p> <p>2 each BRAEGEN (CDC) DISK DRIVES MODEL NO. DD-302-6C</p> <ul style="list-style-type: none"> • APPROXIMATELY ONE (1) YEAR OLD • 300 MB STORAGE PER UNIT • DEC COMPATIBLE • AVAILABILITY: IMMEDIATE <p>CONTACT: Southern Company Services, Inc. Purchasing Department 404/399-3857</p>	<p>NEW * * * USED</p> <p>TERMINALS, CRT's, PRINTERS</p> <p>DEALER IN</p> <p>ADDS • HAZELTINE • TELEVIDEO • DIABLO • NEC • QUME • DEC</p> <p>TEXAS INSTRUMENTS SYSTEMS & COMPONENTS SPECIALISTS FOR</p> <p>DEC</p> <p>TEXAS INSTRUMENTS 200, 770, 990 NORTHSTAR</p> <p>• IMMEDIATE DELIVERY</p> <p>• LOWEST PRICES</p> <p>• NATIONWIDE SERVICE</p> <p>THE COMPUTER BANK Huntington Station, New York 11746 (516) 549-5500</p> <p>BUY BROKER</p>
--	---

Dealers in: IBM PROCESSORS/PERIPHERALS

3350 ALL MODELS
IMMEDIATELY AVAILABLE

3370 NEW AND USED
30-120 DAYS

3375 NEW
30-120 DAYS

3380 NEW
30-120 DAYS

—SELL OR LEASE—

ALSO AVAILABLE:

4331 Systems Used-Immediate

4341 Systems New and Used-Buy and Sell

Series 1 Want to Buy Any Model

System 3 All Models-Best Buys

System 32 Several-Immediate

System 34 Large and Small-Immediate

System 38 New and Used

3880 Mod 1-2-3 30 Days

3278 Mod 2-Immediate

3279 Immediate

3287 Mod 1 and 2-Immediate

3350 Several-For Lease-Immediate

3340 A2 and B2-Immediate

3344 Several Available

3411/3410 Several Available

3420 Most Models

3741/3742 Several Available



MEMBER
AMERICAN
SOCIETY OF
COMPUTER
DEALERS



computer corporation
11006 Prairie Lakes Drive
Suite 800
Eden Prairie, MN 55344

Call Toll-Free
1-800-328-7938
or 612-941-9495 collect

SPECIAL OFFER TO CLASSIFIED ADVERTISERS IN COMPUTERWORLD/MEXICO

The Hottest New Newspaper in the Hottest New Computer Market!

Looking for a new market
for equipment, services,
software or used computers?

Thirty thousand readers of
this Mexican newspaper
are looking for you.

Come together at \$1.90 per
agate line on a 5 column
page like this one
(minimum 30 lines/one column).

Write or call: Alicia Lavastida.
Computerworld/México Oaxaca 21-2 México 7, D.F.
Tels.: (905) 549-3139 514-3219. We'll translate
your ad for \$5.00/page --and set type free.



buy sell swap **buy sell swap** **buy sell swap** **buy sell swap** **buy sell swap**

GMI

AMERICA'S LEADING SPECIALIST SERVING THE USED MARKET

3081/3083
Lease Financing Available
For Your System or Ours
Any Term

Save On NEW 3033
Memory & Feature
BELOW List Price

Save On NEW 3033
BELOW List Price
ITC Qualified

Save On NEW 3033
Upgrade
S-N to N-U
BELOW List Price

3042-2
Attached Processors
Lease or Sale

SYSTEM 3
Models
12 and 15
Dennis Pennington

Wanted 4341-M2
Call Now

Wanted 4341-L01
Call Now

2914
3203 3505/3525
3800 3211/3811
Mary Drangin
3803/3420
Immediate Delivery
Tim Ryan

IBM 3705
IBM 3704
Bill Maiullo

AMDAHL
V8 and V6II
Available for
Sale or Lease

3168/3158
Upgrades
Memory/Channels/Features

3270

SYSTEM 34
SYSTEM 32
Dennis Pennington


MARKETING
California (408) 773-1614 (415) 956-3183 (714) 752-8443
New Jersey (609) 645-7282
Tennessee (615) 449-6633
Texas (214) 385-0806
Montreal, Quebec (514) 871-1121
Paris, France Telex: 613910 CMI FR
Windsor, Ontario (519) 258-8910
CMI FINANCIAL SERVICES, INC.
755 W. Big Beaver, Troy, Mich. 48084
(313) 362-1000

GMI CORPORATION
Since 1969
755 W. Big Beaver, 19th Floor, Troy, Michigan, 48084
TWX/TELEX: 810 232-1667 CMI CORP TRMI

(313) 362-1000

Member CDLA

A Torchmark Corporation



Stack your DEC with WEX

DEC specialists with exciting deals

PDP11/70	CPU, 1MB CORE, H960-DA	\$39,900
P300	300 LPM PRINTER BY PRINTRONIX	\$4,895
P600	600 LPM PRINTER BY PRINTRONIX	\$6,895
KDF11-AA	LSI 11/23 CPU PCB & MMU (M8106)	\$1,300
TS11-AA	1600 BPI TAPE SYS. RACK MNTBLE	\$10,000
9100	75 IPS TAPE DRIVE BY KENNEDY	\$4,795
9000	45 IPS TAPE DRIVE BY KENNEDY	\$3,990
CDC 9762	80 MB DISK DRIVE BY CDC	\$6,200
RP06-AA	176 MB REMOVE RACK DRIVE (USED)	\$13,995
QJ013-CD	RT11 V4.0 SV RLO1	\$1,100

WEX West Coast Computer Exchange Inc.

11109 Folsom Blvd., Rancho Cordova, CA 95670
TWX # 918-367-3707 (916) 635-9340

LOWEST PRICES IN THE WORLD ON MAGNETIC MEDIA

8" SSD, Part #3062, \$1.95
8" SSD, Part #3090, \$2.25
8" DSD, Part #3102, \$2.75
5 1/4" SSD, Part #3481, \$2.00
5 1/4" DSD, Part #3491, \$2.90

The following abbreviations stand for:
SSSD = Single Sided Single Density
SSDD = Single Sided Double Density
DSSD = Double Sided Double Density

Cash or Prepaid. Lifetime guarantee on all media. We have disk packs, computer tape, & mag. cards. Call for prices and to order. We carry BASF and Memorex. F.O.B. Chicago.

KMX Holding Limited
(312) 826-0420

→ NCR USERS

Are You Thinking of Trading Up ↑ ? or Down ↓ ?

Call Us for a Quote

SMITH ANDERSON CORP.
714-340-6666

Authorized NCR Systems Distributor - Nationwide (New or Used Systems)

71-866 Highway 111
Rancho Mirage, Calif. 92270

BROOKVALE DEC

LEASE • SELL • RENT • UPGRADE

PDP 8, 11/03, 11/04, 11/23, 11/24, 11/34, 11/44, 11/45, 11/60, 11/70, VAX/750, VAX/780

SYSTEMS • OPTIONS • SUPPLIES

11/23	128Kb MOS, dual RX02, RT-11	Call
11/34A	256Kb MOS, dual RK07, LA120, RSX11-M	Call
11/44	256Kb, dual RLO2, LA120, RSX11-M	Call
11/70	512Kb, dual RP06, TWE16, LA120	Call
11/780	CPU only	Call

SPECIALS

TWE 16-EA	11X44-CA	LP11-AA
RL211-AK	FP11-F	RJM02-AA
RP06-AA	TU77-AB	RK711-EA

BROOKVALE ASSOCIATES
(800) 645-1167 • NEW YORK (516) 567-7777
40 ORVILLE DRIVE • BOHEMIA, NEW YORK 11716

ALL 370 & 4331 SYSTEMS

CPU's & Peripherals
Purchased, Sold & Leased

CORPORATE COMPUTERS, INC.

Contact: Norm Burger

(203) 661-1500
115 Mason St., Greenwich, Conn. 06830
Member Computer Dealers & Lessors Association

SALE PURCHASE

DATA GENERAL

S/140, 256KB, C/S	6061 190 MB Disk System
C/350 System w/AOS	6045 10 MB Disk System
S/230, 512KB EAU, AOS	6095 10 MB Disk System
C/S30, C/S40, C/S50	73 MB & 147 MB Disk Systems
Nova's 4x, 3/12, 2/10, 840, 830	6060 96 MB Disk System
Micro Nova, 64KB, I/O	6100 25 MB w/1.2 Disk System
6026 & 6125 Map Tape Systems	6097 A 1.2 MB Floppy
Eclipse 256KB & 128KB Memory	D400 & D450 CRT's
Nova 3 64KB Memory	G300 Graphics Term
ALM-16, ULM-5, SLM-2, DCU 200	8040 TPI Terminal
AMR-8, ATI-16, 4082, DCU-50	6053/6012/D100/D200 CRT's
	6070 20 MB Disk System

AMES SCIENCES, INC.
301/397-3140

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap



PINZONE & ASSOCIATES, INC.
807 South Main Street
Duncanville, Texas 75137
8:30 a.m. - 5:30 p.m. CST
Monday - Friday

**DATA GENERAL — DEC
HP-INTERDATA**
SALE/TRADE/LEASE
or CASH BUYER

Pinzone & Associates is dedicated to maintaining the professionalism required by our many customers at the lowest possible prices.
Call us at (214) 780-1600
or Telex 730121 PINZONE DCLV

COMPUTERS

Novel 820 Chess	\$ 500
C 330, 256KB	9,500
S 200 Chess	3,000
S 230 Chess	4,000
6402, 488KB Core, MMIO	2,500
3112, 328KB MOS	2,750
4X16, 256KB	10,500
S 130, 128KB, w/COS License	11,500
S 140, 192KB, No Mem	13,000
CS 20, Dual floppy	3,500
Novel 2110, 16KB	250
General Automation 16/40 BKW	1,000
Novel 1200, 10 Slot, CPU	350
Novel 1200, 4 Slot, CPU	250

CONTROLLERS/I-O's

EAU Raising Port	\$2,000
MMIO	2,500
Novel 640 Raising Port	1,500
MMIO	1,500
10 MB Disk CTRL	750
ALMA-84	850
ALMA-16	2,100
ALMA-8	1,450
Comm. Chassis (4251)	1,200
600051 Disk CTRL & Adapter	4,200
4007 Basic I/O	100 s.e.
4075 Cassette I/O	100 s.e.
Programmed I/O	1,200
Burst Multiplexer	1,400
4003 4 Line Async. Mod	1,200
UJM-5 (4251)	700
SUM-1 w/CRC	800
SUM-2 w/CRC	800
Triple Option	500 s.e.
DEC DL11W	200

STORAGE

6050	96 MB Disk S/S \$17,500
6061	192 MB Disk S/S 20,400
6061-H	192 MB Disk S/S 22,500
6045	10 MB Disk S/S 3,900
6021	800 BPI Tape S/S 4,900
6021-A	800 BPI Tape Add-On 3,500
6026-A	800/1600 BPI
	Tape Add-On 10,200
4234	10 MB Disk S/S 2,900
4231	96 MB Disk Add-On 1,500
4084	Dual Cassette 150
4057	25 MB Disk S/S 1,000
Datab	33 2.5 MB 500

MISCELLANEOUS

Documentation M1000 Card Reader	\$750
Digital Data MODEMS	
1200/2400 Baud	400
SYNCROPY Disk RS232	200
XERCES Disk Controller XDF-70	100
Paper Tape Readers	50
Paper Tape Punches	50
Data General Disk Packs	200 s.e.
Data General Dual Comm. Chassis	
Bus Switch	450
DABLO 1620	
Letter Quality Terminal	1,450
Acoustic Couplers New and Used	70 s.e.
DATUM Disk Controllers 84091	200
DCC Controllers Disk & Printer	200

WE WILL CONFIGURE FOR
YOUR APPLICATION

DISPLAYS

6053	\$ 1,450
6012	400
ADM-3A	325
ADM-3A LIL Case	355
Hydram 1028A	855
Hydram 1500	600
ADM-31	650
ADM-3	250

PRINTERS

4215 600 LPM PPR S/S	\$7,500
6040 TR	1,025
GE 1200 Spk. Plotter	300
TI 810	650
TI 743	650
TI 745 NEW	1,000
Calcomp 665	200
Centronics 703	650
DEC L435 (Refurbished)	330
33 ASRITY	50
DEC L435 (New)	450

MEMORIES

60L	256 KB Mos.	\$4,000
60L	32 KB Mos.	900
60L	16 KB Core	200
60L	16 KB S/S Core	200
60L	8 KW Core	150
Novel 3	16 KW Core	250
Novel 2	32 KW Mos.	950
Novel 2	16 KW Core	600
Novel 1200	4 KW	200
Novel 1200	8 KW	250
Novel 1200	16 KW	490
Novel 840	8 KW Core	250
Novel 4	256 KB Mos.	3,200

Equipment Catalog #6082

WANTED!
SYSTEM/32 **SYSTEM/34**
If you have a System/32 or System/34 to sell, we would like to buy it. Since we are dealing on behalf of already committed buyers, we can afford to pay top dollar for your computer.

CONTACT
Mr. William Bell
National Medical Computer
Services, Inc.
7578 Trade Street
San Diego Ca. 92121
(714) 566-9920

XERXES
COMPUTER SALES

S/34 SERIES 1 5110

S/38 S/3 S/32 S/23

We Buy, Sell and Lease All IBM Products

800-328-3884 612-339-3042

1614 Herman Pl., Ste. 210 Minneapolis, MN 55403

DATA GENERAL
New & Used Equipment

**BUY. SELL.
TRADE.**

(313) 583-4100

TLX: 810 232 4866
Answer Back: MCDATAGEN MAHS

McINTYRE'S

Mini-Computer
Sales Group Inc.

32050 Edward Ave.
Madison Heights, MI
48071

LOW PRICE
System/3-15D25

3277-1 3741-1
3340-1 3344-B2
1403-N1 5421-1

3277-1, 4631

(Qty. 11)

Financing at 12%

COI 800-328-5718
612-544-8660

**WANT TO BUY
IBM
SYSTEM 38**
5381 CPU Model 582
3370 Disk Model A11
Printer And CRT's
Or Similiar
Upgradable System
Can Take Immediately
Call 1-800-543-8670
(Not a Broker)

SYSTEMS • PERIPHERALS • PARTS

DG DEC

Phil Thomas
305-392-2006

Bryan Eustace
305-392-2005

Jennifer Eustace

305-392-2007 TELEX 568-670

BUY - SELL - TRADE - LEASE

THOMAS BUSINESS SYSTEMS, INC.

BUY ■ SELL ■ LEASE
PURCHASE / LEASEBACK

SERIES / 1

SYSTEM / 23, 32, 34, 38

SYSTEM 360 / 370

4331 3031 3033

4341 3032 3081

IBM Peripherals

- ✓ FEATURES & PERIPHERALS SOLD SEPARATELY
- ✓ GUARANTEED FOR IBM MAINTENANCE
- ✓ SYSTEMS CONFIGURED TO YOUR REQUIREMENTS
- ✓ IN-HOUSE STAGING PRIOR TO SHIPMENT
- ✓ REFERENCES FURNISHED

FRONTIER

COMPUTER CORPORATION

4575 S. Westmoreland • Dallas, Texas 75237

214 - 330-7243

ascd

IBM
BUY SELL LEASE
System 34 & 38
Wanted
5256, 5211, 3262
5251 Model 11 & 12
3370-A11 & B11
Jim Kelley
Coastal Computer Marketing
(213) 986-4830 **CCA**

CDC **DISK DRIVE SPECIALISTS**

80 MB 300 MB PHOENIX
• Packs, Heads, Filters, PCB's
• Field Service
• Emergency 24 hr. Parts Service

WANG
DPU - PHOENIX Disc Drive
available immediately
SYSTEM MEMORY UPGRADES

XETA, INCORPORATED
51 LAKE STREET
NASHUA, NEW HAMPSHIRE
(603) 881-8122

New DEC Equipment
Quick Delivery

L0P02-AA	LA120-DA
LA120-RA	RK07
RA80	RM80
MS11-LD	MS11-MB
MS11-MC	MS750-AB
MS750-AC	MS780-DC
MS780-DD	DZ11-A
DZ11-E	DZ11-B
DZV11-B	DS30L-AA

Spartin Systems
14925A Memorial Drive
Houston, TX 77079
(713) 496-0771

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turn-key Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are \$97.30 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs \$194.60 per insertion. Extra space is available in half-inch increments and costs \$42.35. Box numbers are \$10.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us), WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired: _____ columns wide by _____ inches deep.

Issue Date(s): _____

Section: _____

Signature: _____

Name: _____

Company: _____ Title: _____

Address: _____

Telephone: _____

Send this form to:
CLASSIFIED ADVERTISING, COMPUTERWORLD
375 Cochituate Road, Box 880, Framingham, MA 01701

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

Find your Digital product here, & we'll give you up to

50% off.

Get your magnifying glass out and find yourself great deals on these brand new and fully guaranteed Digital products. Better hurry though, prices are good until October 3rd, but supplies are limited.

To order, simply call the special toll-free number listed below any weekday between 8:30 A.M. and 6:00 P.M. Eastern time. Standard Accessories and Supply Group discounts apply. Standard terms and conditions apply except as otherwise noted here. You must agree to accept immediate delivery. Digital reserves the right to limit order

quantities. Orders must be a minimum of \$35 unless charged to MasterCard or VISA. Maximum order by phone is \$5,000. All orders over \$5,000 must be accompanied by a purchase order and should be mailed to: Digital Equipment Corporation, P.O. Box CS2008, Nashua, NH 03061.

Call 800-258-1710 now to order. In New Hampshire, Alaska, and Hawaii, call: 603-884-6660, or contact your local Digital Sales Representative.

Part Number	Description	Regular Price	Sale Price*	% Off	Part Number	Description	Regular Price	Sale Price	% Off
BJ-00871-A	120V 12A Power Control Unit	\$444	\$222	50	BJ-W133-00	Double Mount Board PDF-11	\$672	\$504	25
BJ-BB11-00	Bus Interface With 18 Unwired	\$294	\$147	50	BJ-W602-00	FT11A Extender Board	\$265	\$172	35
BJ-BB11-A	Bus Interface With 18 Unwired SL	\$294	\$147	50	BJ-W990-00	Blank Module	\$74	\$37	50
BJ-BB11-H	Bus Interface, SP For 4N, 4Cout	\$379	\$190	49	BJ-12-05375-00	SWRKR.SPOT. 3A @ 125V, Momentary	\$6	\$4	33
BJ-BC08H-3F	M937 To M936 60 Cnd Myr 3.5'	\$250	\$125	50	BJ-19-09486-00	DEC 384 or Gate-Quad 21N,	\$3	\$2	33
BJ-BC08H-4F	M937 To M936 60 Cnd Myr 4.5'	\$265	\$133	49	BJ-19-09704-00	DEC 314A Nor Gate-Single 7	\$3	\$2	33
BJ-BC08H-OM	H807 To H807 Mylar 11"	\$250	\$125	50	BJ-19-09705-00	DEC 888 1-Inand Gate-Quad 21	\$3	\$2	33
BJ-BC21T-05	Keyboard Cable For VK 170-CA	\$120	\$60	50	BJ-19-10309-00	DEC 7380 Nor Gate-Quad 21N	\$3	\$2	33
BJ-BC21V-15	RS 170 VIO Cable For VK170-CA	\$110	\$55	50	BJ-19-14072-00	7A159 Decoder 4 To 15 D	\$3	\$2	33
BJ-G111-00	Sense Inhibit	\$817	\$531	35	BJ-30-05981-00	Disk 1/4 RF08	\$1,237	\$928	24
BJ-G227-00	Drive XY	\$449	\$337	24	BJ-4A-BDV11-AA	BDV11-AA Spare Module Kit	\$800	\$520	35
BJ-H212-00	BK 12 Bit H211, MM8-EJ	\$1,652	\$826	50	BJ-4A-LITCA-BG	Lot of 10, H9610-AC(30) CB N/PC	\$7,328	\$4,894	34
BJ-H7835-00	VT 103 Universal Power Supply	\$1,480	\$740	50	BJ-4A-LITCA-BH	Lot of 25, H9610-AC(30) CB N/PC	\$16,468	\$10,704	35
BJ-H808-00	Connector Block	\$25	\$13	48	BJ-4A-LITCA-BJ	Lot of 5, H9610-AC(30) CB N/PC	\$28,230	\$21,173	24
BJ-H9272-00	Panel Mfg 1103-L	\$497	\$249	49	BJ-4A-LITCA-BM	Lot of 5, H9610-AC(30) CB N/PC	\$4,000	\$2,600	35
BJ-H9610-AC	1103-L Cab 30" W/O Power Cnl	\$1,350	\$675	50	BJ-4A-LITCA-CG	Lot of 10, H9612-AC(40) CB N/PC	\$9,496	\$6,172	35
BJ-H9612-AC	1103-L Cab 40" W/O Power Cnl	\$1,590	\$845	50	BJ-4A-LITCA-CH	Lot of 5, H9612-AC(40) CB N/PC	\$20,773	\$13,502	35
BJ-H9615-BA	R. H. 30" Solid Top Exp. Cab	\$895	\$448	49	BJ-4A-LITCA-CJ	Lot of 5, H9612-AC(40) CB N/PC	\$35,610	\$26,708	24
BJ-K138-00	Eight Inverters	\$29	\$19	34	BJ-4A-LITCA-CK	Lot of 5, H9612-AC(40) CB N/PC	\$5,045	\$3,279	35
BJ-K579-00	AC Input Schmitt Trigger	\$168	\$126	25	BJ-4A-LITCA-CA	Lot of 10, H9616-BA(30) CB RH	\$6,464	\$4,202	34
BJ-K943-S	Mounting Panel (K943-WP)	\$319	\$160	49	BJ-4A-LITCA-CB	Lot of 5, H9616-BA(30) CB RH	\$14,140	\$10,605	25
BJ-LK001-A	LA36 Keyboard W/O Numeric Pad	\$195	\$146	25	BJ-4A-LITCA-FC	Lot of 5, H9616-BA(30) CB RH	\$24,240	\$18,180	25
BJ-M107-00	Device Selector	\$104	\$78	25	BJ-4A-LITCA-FD	Lot of 5, H9616-BA(30) CB RH	\$3,434	\$1,717	50
BJ-M1707-00	Waveform Generator	\$1,287	\$644	49	BJ-4A-LITCA-BG	Lot of 25, H9616-BA(30) CB RH	\$3,774	\$2,453	35
BJ-M1738-00	Counter Buffer Interface	\$92	\$87	5	BJ-4A-LITPC-BA	Lot of 5, 871-A/PC, 120V 12A	\$1,998	\$999	50
BJ-M1746-00	Bus Register	\$69	\$66	4	BJ-4A-LITPC-BB	Lot of 10, 871-A/PC, 120V 12A	\$3,774	\$1,887	50
BJ-M1729-00	Servo Analog Board RK06	\$1,161	\$872	24	BJ-4A-LITPC-BC	Lot of 25, 871-A/PC, 120V 12A	\$8,880	\$4,440	50
BJ-M8047-HA	MXV11-HA 16KW RAM, 2 Async EIA	\$1,517	\$896	35	BJ-4A-LITPC-BD	Lot of 50, 871-A/PC, 120V 12A	\$16,650	\$8,325	50
BJ-M8143-00	Mem Transceiver Card	\$943	\$472	49	BJ-54-1023-00	LA 180LS 120 PCB W/O ROMS	\$496	\$372	25
BJ-M8258-00	Multiport Port Inter	\$2,833	\$2,125	24	BJ-54-1216-00	Power 154C2 LA 180	\$402	\$31	24
BJ-M8259-00	Multiport Port Cont	\$2,563	\$1,922	25	BJ-54-1267-00	Battery Charger	\$385	\$289	24
BJ-M8260-00	Multiport Array	\$2,464	\$1,848	25	BJ-54-1336-00	+2.5V Control Board	\$291	\$25	92
BJ-M8261-00	Multiport Synchronizer	\$3,009	\$2,257	24	BJ-70-06593-01	Cable Module L733	\$103	\$52	49
BJ-M8275-00	MSB Massbus Adapter SBI Inter	\$2,018	\$1,514	24	BJ-70-0935-02	Transformer Assy 50Hz	\$394	\$256	35
BJ-M8291-00	CR11 CM11 Control	\$1,121	\$581	49	BJ-70-1151-00	Form Cont Cable Assy	\$32	\$64	50
BJ-M8920-00	Adapter T503	\$506	\$380	24	BJ-70-13585-02	TE 16 7 Track Narrow Radius	\$1,935	\$968	49
BJ-SKD11-D	KD11-D Spare Module Kit	\$2,270	\$1,476	34	BJ-70-18124-03	Lineaset Assy.	\$71	\$36	49
BJ-SPMRV-BA	MRV11-BA Spare Module Kit	\$390	\$293	24	BJ-70-16799-00	Keypad Assy. 120 R/O, Brown	\$108	\$103	4
BJ-SPMSV-BA	MSV11-B Spare Memory Kit	\$670	\$517	22	BJ-70-17032-00	Still Level Disk Top Assy	\$385	\$193	49
BJ-SPMSV-DA	MSV11-D Spare Module Kit	\$730	\$565	50	BJ-74-18446-00	Terminator Isolator	\$5	\$3	40
BJ-SPRLB-A	RLB-A Spare Module (M8433)	\$1,720	\$860	50					

*U.S. dollars

digital

DEC SYSTEMS

Software support, complete installation

Immediate delivery on
11/780, 11/750, 11/70, 11/44, 11/24, 11/23

New & used disk & tapes
RM05, RP06, RM03, RM02, TS1, TUV7
Non DEC peripherals, CDC, Kennedy, Emulex
Terminals and options
VF-100, LA120, DZ11, FPI's, DUP1's

Call (408) 738-3368

international data services
1020 Stewart Drive
Sunnyvale, CA 94086 TWX 172-189

Buy & Sell

IBM UNIT RECORD EQUIPMENT

DISK PACKS, DATA MODULES, MAG, TAPE, DISKETTES



SALE OR LEASE

026	084	129	548	2316
029	085	514	555	3336(11)
082	087	519	3742	3336(11)
083	088	526	360/20	3348(70)

Highest prices paid for used packs & machines.



Thomas Computer Corporation
800 North McClurg Court, Chicago, IL 60611
800-621-3908 Ill. 312-944-1401

Authorized Distributor
Memorex
CDC
3M
BASF

BUY SELL LEASE

Series/1
Peripherals & Features
Systems 32-34-38

5110-5120
3778-3777
3741-s-1 & 2; 3742-s
3271-3272-3276-3277
3278-3286/88
029-129-3747-3540
3340-3344-3350-3370-3375
4331/4341
5251-11's & 12's

Various items of Unit Record
Equipment
082-083-084 548-557 059-085

BEDFORD COMPUTER MARKETING, INC.

4141A Greenbriar
Stafford, TX 77477
Tel. (713) 491-6757

We Buy & Sell DEC Systems Components

call: 713 445-0082
Digital Computer Resale
600 Kenick Ste C22
Houston, TX 77060

SYSTEMS BUY/SELL PERIPHERALS

WANG
DATA PROCESSING &
WORD PROCESSING
PCS, Z200T, MVP, VP, LVP, VS
WPS 5 Models 1, 2, & 3
WPS 20, 25, 30
CPU's, CRT's, Disk & Tape Drives,
Printers, Memory Upgrades

ERST international (212) 431-1100

INTERSTATE COMPUTER EXCHANGE

EXPERTS IN

IBM

BUY•SELL•UPGRADE

S/34

S/38 • S/32 • S/23 • 5110 / 5120
SERIES 1 • ALL IBM EQUIPMENT

- Guaranteed IBM Maintenance
- 25 to 35% Off IBM List

WANTED

- All S/34 Configurations
- 5256 • 5251 • 5211 • 3262
- Any leased or rented 34's
- We customize any System 34
- All Peripherals and Upgrades Available

CALL COLLECT: PAUL CAYTON
714-578-5410

FOR SALE OR LEASE - IBM S/3

- Available for Immediate Delivery
- 3277-002 w/4631 CRT
- 3277-001 w/4632 Console
- 3340-A02 D.A.S.F.
- 3411-3 w/7003, and 3211 Tape Drive
- 3741-001 w/4002, 6123 & 3265
- 5421-001 Printer Control

Call Barry Tessler
PEARL EQUIPMENT COMPANY, INC.

P.O. BOX 24026 • 4717 CENTENNIAL BLVD
NASHVILLE, TENNESSEE 37202
(615) 383-8703



ALSO:
System/34
System/38

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

We're number 1 for Series/1

Computer Options, Inc. is the world's largest remarketer of IBM SERIES 1 mainframes and peripherals. And we're also no slouch when it comes to new hardware—with a wide array of discounted value-added hardware packages. We offer you the option of buying or leasing. And in most cases we will purchase your old system. Call us toll-free for more information.

AVAILABLE NOW FOR IMMEDIATE INSTALLATION

4955-F	4973-2
4955-E	4974-001
4959-A	4975-2L
4962-2	4969-04P
4964-001	7850's

ALSO AVAILABLE—SYSTEMS 34 & 38

Call toll-free 800-328-5718
(in Minnesota, 612-544-8660)



COMPUTER OPTIONS, INC.
"the best option"
1660 South Highway 100
Minneapolis, MN 55416

SALE OR LEASE

30 DAY DELIVERY

3380-AA4
3380-B4
3880-3

AVAILABLE NOW

3880-D11

IMMEDIATE DELIVERY

3350
3370
3375

Contact Your Local Office

Atlanta	404—256-5956	Florida	305—428-3177
Boston	617—542-4005	Ft. Worth	817—534-1774
Chicago	312—698-3000	Michigan	313—644-1500
Connecticut	203—655-1211	New Jersey	201—568-9666
Dallas	214—258-6444	San Francisco	415—944-1111
Washington, D.C.	301—441-1000		



DEC

Discs & Tapes

RK06/EA	1,500
RL01/AK	Call
RL02/AK	2,300
RM03/AD	11,000
RM03/AA	15,900
RP06/S	18,000
RP06/C	3,500
TU45/KE	Call
TU45/EC	Call
TU58/VA	900
TE18's	Call
TU78/IB	6500

Options Peripherals

BAT1/KE	2,050
DH11/AE	Call
DH11/AD	Call
DL11/W	550
DMC11's	Call
DR11C	475
DUP11/DA	995
FP11/A	1,495
KK11/A	1,795
KMC11/A	1,900
KT11/D	650

Terminals

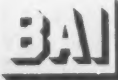
LA120's	(new & used)
LA38's	(new)
LP11/WA	(new)

Call
Call
Call

CPU's

11/34 11/35 11/40 11/45 11/70's

Specialists in Digital Engineering



Carl R. Boehme Associates, Inc.

2378-A Walsh Ave.
Santa Clara, California 95051
408-727-2666 Telex 172-337

FOR SALE PRIME

T1300 - HMB
300 LPM Printer
Beehive Terminals
Call 801-295-5621

FOR SALE

Uninterrupted Power Supply
Emerson Electric Model AP5604
500 KVA
15 Minute CD Batteries
Uninterrupted Power Supply
Emerson Electric Model AP5604
325 KVA
15 Minute CD Batteries
Available Immediately
WANTED TO BUY OR LEASE
IBM 2944A1-A2
Channel extender Imm.
Call Ted Orlando
T.J. COMPUTER SERVICES, INC.
140 Wilbur Place, Bohemia, NY 11716
(516)567-1212

UNIVAC AVAILABLE

90/60 System & Peripherals
1900 CADE System & CRT's
BC7-800 System
1100/82 2 Meg
90/40 CPU/8433 Disk
Other Systems Available
Buying & Selling Univac
ANRIX CORPORATION
Tel.(602)949-0105

For Sale Complete NCR System

CPU 8450 (256K)
Tape Drive 634
(3) Disk Drives 658 (200MB)
Printer 647
Add'l VHS Trunk, IDC Control
Mod, Under Maintenance Con-
tract, Available Now - \$82,000

Call D. Felice
(215) 641-2300

WANG
800-526-0791

IN NEW JERSEY (201) 884-0920

BUY AND SELL: 2200T, VP, MVP, VS
WORD PROCESSORS

STANDARD
DATA EQUIP. INC.

SDE

LARGEST
AND MOST ACTIVE
IN THE USA

**LEASES
(SHORT TERM)
3287's**

Call 214/258-0541



**METROPLEX COMPUTER
COMPANY, INC.**
320 Decker Drive • Suite 180
Irving, TX 75062 TWX 910-860-9285

**For Sale
TRIAD
Model 30**

CPU w/4 disk drives
(13) Display terminals
(7) 100 lpm Printers
(2) Model 1 Mux's
under TRIAD maintenance

**CALL: Jim Meeks
800-238-7115**

BUYING?

Whether you're
looking for
big computers
little computers,
terminals, printers,
software, time sharing
or services,
you'll find it in
Computerworld
classifieds.

Pages of ads every week,
with everything from Discs to
DEC's from time sharing to
terminals, and software for
every size computer system.

You'll find
what you need in
Computerworld
classifieds.

**Call 800-343-6474
(or 617-879-0700)
for more information**



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

375 Cochituate Road, Box 880, Framingham, MA 01701/(617) 879-0700

buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap	buy	sell	swap
-----	------	------	-----	------	------	-----	------	------	-----	------	------	-----	------	------

BURROUGHS 6610
Available 9/15

BURROUGHS 2930
Available 9/1

BURROUGHS 5930
Available Immediately

BURROUGHS 4800
Available Immediately

2480 W Alameda Ave.
Denver, Colorado 80223
(303) 922-8331
Telex: 910-931-0483

DSI
Member
National Computer Dealers
& Distributors Association

MEMORY BOARDS

NEW COMPATIBLE WITH
DEC-DG HARRIS
AND MANY OTHERS

DISK PACKS
ANY MANUFACTURER
FULL DEPOT REPAIRS

DIGITAL DATA SYSTEMS, INC.
160 N.W. 8th Ave., Ft. Lauderdale, FL 33311
305-792-3200
1-800-327-5662
TELEX-232005 ATT OIG

BUY • SELL • TRADE

CC DIGITAL COMPUTER CONSULTING, INC.

DEC DG CDC
PROCESSORS • MEMORIES •
TAPES • CONTROLLERS •
DISKS • CRTS • PRINTERS •
AND MUCH MORE ...

call JOHN SULLIVAN 617-587-2900
P. O. Box 1947 BROCKTON, MA 02403

**CALL FOR OUR
MONTHLY SPECIALS**

**Buy/Sell/Lease
SWITCHING**

IBM 2914/3814
Locom LCM-500
T-bar 3915/3916
DataSwitch 1000
Beall BCS-3/BCS-5
Jack McAuliffe
4255 LBJ Freeway #210
Dallas, TX 75234
214-661-3981

BRAND NEW WARRANTY • BRAND NEW •

SCHERER'S SPECIALS

DEC CRT's		DEC HARDWARE & OPTIONS	
VT100-AA	\$1,325	UNIBUS	
VT100-WA	1,450	DZ11-A	\$2,000
VT101-AA	975	DZ11-B	1,500
VT102-AA	1,395	DZ11-E	3,500
VT102-WA	1,450	DMC11-AL/	
VT125-AA	2,750	DMC11-MD Set	2,500
VT125-AA W/AVO	2,850	DD11-CK/CF	300
VT131-AA	1,295	DD11-DK/DF	600
VT131-WA	1,350	DH11-AD	4,900
VT132-AA	1,450	BA11-KE	2,400
		FP11-A	2,100
DEC PRINTERS		DL11-A & C	375
LA38-GA	895	DL11-WA	595
LA38-HA	995	DL11-WB	675
LA38-AA	1,000		
LA34-DA	795	DISKS	
LA34-AA	825	RLV22-AK	4,400
LA120-RA	1,695	RL211-AK	4,000
LA120-BA	1,975	RL02-AK	2,400
LA120-AA	1,895	RXV211-BA	2,700
LA100-RA	1,625		
LA100-YA	1,725	CPU BOARD SETS	
LA100-ZA	1,995	11/34A CPU-SET	1,200
		KDF11-AA	1,500

CALL NADINE OR LAURIE
@ (614) 889-0810

SCHERER'S
6145 Dolan Place
Dublin, OH 43017
(614) 889-0810

**In Kentucky Call:
Dave or Mike at:
(502) 425-9911

Scherer's of Kentucky
10347 Linn Station Rd.
Louisville, KY 40223

CALL GARY OR GORDON
@ (614) 889-0810

BRAND NEW WARRANTY

FOR SALE
IBM SYSTEM/34
5340-F36
W/2500, 3701, 4901
AVAILABLE IMMEDIATELY.

CALL TARGA
FINANCIAL, INC. (612) 544-0600

DEC SHOPPER'S LIST

Item	Unit Cost
DR11-C	\$ 400
DV11-AA	1,600
H9602 Cabinet	995
11/34A-LE	4,875
M7800 Bds (2)	250
TU77-AF Slave	16,000
RL11 Ctrl (3) New	1,500
H960-CA (5) New	1,500
MM11-DP (10)	50
DV11-BB	1,000
DV11-BC	1,100
MK11-CE (1)	4,950
RK611 CTL Complete	3,500
DMR11-AC (2)	3,750
H9602-HA Incomplete	Call
H967 Cabinet	400

**C. D. SMITH &
ASSOCIATES, INC.**
(713) 578-8464

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee.
Full Reels, All External Labels Removed
Guaranteed for use at 800 BPI through
6250 BPI.

2400' Reel \$4.95 ea.
1200' Reel \$4.25 ea.
600' Reel \$3.50 ea.

All Tapes with Hanging Seals
We pay freight on orders over 200 tapes
All orders shipped within 48 hours

Call or Write
Computer Tape Mart
169 B New Highway
Amityville, New York 11701
(516) 842-8512

Buy - Sell - Lease

S/32
S/34
S/38

IBM

3741
3742

CPU's CRT's PRINTERS
ALL MODELS
PURCHASE/LEASEBACK
SHORT & LONG TERM LEASES

**Computer Marketing
of America, Inc.**

P.O. Box 90907
422 Acklen Park Drive
Nashville, Tennessee 37209

Call: Dick Geyer

1-800-251-2670
In Tennessee: 615-297-7516



FOR SALE

Complete ICL/SINGER SYSTEM
Whole or Individually

- (1) ICL 220 CPU w/180 K Mem & w/Expands-on Cabinets
- (2) ICL 44 Drives w/3 Disk Packs
- (1) Singer 57 Printer
- (10) ICL Model B2 CRT's
- (4) ICL Model 81 CRT's
- (3) VA3455P Modems
- (3) VA871B Telephones
- (2) Black Box Comm. Interfaces
- (2) Peripheral Switches

Call Ms. Sara King
Audio Visual Educational Systems
(713) 783-3440

FOR SALE OR LEASE

IBM 3705/E8 Contr.
IBM 3375 DASD
IBM 3370 DASD
AVAILABLE NOW

Please Call:
(312) 943-3770
Forsythe/McArthur
Associates, Inc.

919 North
Michigan Avenue
Chicago, Illinois 60611

MARION

BUY-SELL-RENT

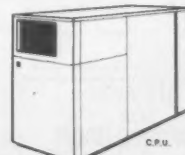
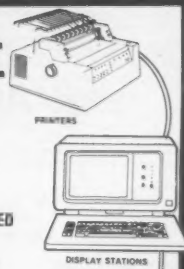
IBM SYSTEM/34

- IMMEDIATE DELIVERY
- ALL SYSTEMS ARE FULLY RECONDITIONED AND RE-CONFIGURED TO YOUR NEEDS
- GUARANTEED IBM MAINTENANCE
- PERIPHERALS
- UPGRADES
- FEATURES
- SHORT TERM RENTALS
- LONG TERM LEASES AT GUARANTEED SAVINGS
- PURCHASE/LEASEBACKS

A PHONE CALL CAN SOLVE YOUR EQUIPMENT PROBLEMS

TALK TO US ... NEW JERSEY (201) 343-4554
CONNECTICUT (203) 758-2409

WILLIAM MARION CO., INC.
84 KENNEDY STREET, HACKENSACK, N.J. 07602



DATA GENERAL

We Buy, Sell And Service

New And Surplus Systems and Peripherals

Call Or Write

Hanson Data Systems

(outside Mass. toll free)

1-800-225-9216

(within Mass.)

(617) 481-3901

P. O. Box 27, Southboro, MA 01772

buy sell swap

buy sell swap

buy sell swap

buy sell swap

buy sell swap

ANY TERM LEASE
3033S8
 AVAILABLE NOW
 CALL
CHARLIE ALBRIGHT
(212) 742-2241

Available Now
4331K2
 Loaded
 Call Tom Cutter
 Leasing Dynamics,
 Inc.
 1717 East
 Ninth Street
 Cleveland, OH 44114
(216) 687-0100


THE BULLETIN BOARD

A Low-Cost Way to Sell Hardware and Software in Computerworld

What is The Bulletin Board?

It's a classified section in Computerworld designed especially for the selling and buying of individual pieces of hardware in a convenient, low-cost format. It is especially suited to companies that have a piece of used equipment they want to sell. For one low price, you can inform more than half a million Computerworld readers around the country of your equipment's availability.

How Does The Bulletin Board Work?

Bulletin Board ads come in standard units (one column wide by one inch deep) and standard typefaces. (Units may be combined to produce deeper ads, but one column is the maximum width and no units of less than one inch are available.) Ads are arranged under headings (such as "IBM", "DEC" or "Printers"). The headline of the ad is set in larger, bold type, and should contain the standard equipment identification. The body copy should describe the equipment very briefly and give the person to contact. This is all the information an interested buyer needs to follow up. No ad should have more than one piece of equipment or software.

Price for each standard unit is only \$99. (One unit minimum and no fractional units available.) Anyone can place an ad, but no agency commissions are paid, no quantity discounts allowed, and no credit toward rate is given for contract advertisers who advertise in other sections of Computerworld. It's a simple and effective system for buying and selling hardware and software.

How to Place an Ad in the Bulletin Board.

Ads are accepted in the mail, by phone or by telecopier. Ads can be accepted up until the Monday before issue (7 days in advance of issue date). You should write out your ad before submitting it. (The standard size will hold approximately 25 words of copy.)

Once you've written your ad, send it in with the coupon below or call one of our ad-takers. (If your company has never advertised with us before we request a check with your order.)

Remember that all ads are standard. No special typefaces, no borders and no logos are allowed. Ads are set on a six-column page in our classified section under the heading "The Bulletin Board." We assume no liability for errors beyond the price of the ad in the case of material errors.

BUSINESS OPPORTUNITIES

DEALERS WANTED

If you are an aggressive office equipment dealer preferably now selling word processing or small business systems and would like to be considered for handling our product write or call us now.

We are about to commence an aggressive sales program of a British designed personal computer that uniquely fits business, professional, scientific and technical user needs. Sales in Europe have been extremely successful with one customer alone ordering 2,000 units. The product is very competitive with comparable models now being offered in the U.S.A. and will retail for about \$500.

Z80 System with 32K of RAM, RS232, single line display and interfaces to a wide range of peripherals. Basic compiler, CP/M, graphics, test processing and Math Pack are elements of software.

Grundy Terminals, Inc.
 3939 Ruffin Rd.
 San Diego, CA 92123
(714) 278-6500

THE PROFITABLE TRANSITION!

If you have thought about owning & operating your own business, ROMAC® may be your answer. We are a successful executive recruiting firm with 15 locations, serving the accounting, finance, data processing & banking professions. ROMAC® professionals come from firms such as Price Waterhouse, Arthur Andersen, Coopers & Lybrand, Peat Marwick, IBM, Digital Equip., Software Intern'l, Honeywell, Marine Midland Bank, State St. Bank & Central Penn Nat'l Bank. We are seeking franchisees with experience in accounting, finance, data processing, banking or personnel consulting. If you have experience in one of these fields, some capital to invest & a sincere desire to succeed, ROMAC® can provide you the challenge & satisfaction of owning your own business. For additional information, please call.

ROMAC®

800-341-0263

Three Canal Plaza, P.O. Box 7469 DTS, Portland, ME 04112.
 In New York: Franchise offerings made only by formal prospectus.



AUCTIONS

TELECOMMUNICATIONS EQUIP. I
AUCTION!
THURS., SEPTEMBER 30 10 a.m.
GTE TELENET COMM., CORP.
2727 MERRILEE DR.
FAIRFAX, VIRGINIA

Large Selection of: CENTRONICS 101A Printers; Burroughs Terminals; GENRAD 2235 Logic Testing Syst.; Time Plex Cards; Modems; Power Supply's; Chassis; Cabinets; Disc Drives; Channel Cards; Driver Cards; Hspid. Control Cards; Terminals; Office Furniture; File Cabinets; Work Benches; Consoles; Forklifts; Circuit Boards; etc.

TERMS: CASH — CASHIER'S CHECK — CO. CHECK w/2 bank letters of credit. Full payment w/negotiable funds on sale day!

Info. - Jack LeMay 703/442-1000



Write/call for illust. Brochure!

RENE BATES
Auctioneers, Inc.
 RT. 4 • McKinney, Texas
 214/542-1604 • 75069

REAL ESTATE

OFFICES AND COMPUTER ROOM DALLAS

6000 sq. ft. or less with 1000 sq. ft. raised floor. Temperature controlled computer room. Take advantage of this expensive room at no extra cost.

Agent/Ms. Peck
(214)324-5262

Find the
 right facility
 in the
 Real Estate
 pages of
Computerworld

ORDER FORM COMPUTERWORLD BULLETIN BOARD

Issue Date(s): _____

Signature: _____

Name: _____

Title: _____

Company: _____

Address: _____

Telephone: _____

Send this form to:

COMPUTERWORLD BULLETIN BOARD
 375 Cochituate Road, Box 880
 Framingham, MA 01701

617-879-0700


800-343-6474

The Bulletin Board

Buy • Sell • Lease Buy • Sell • Lease

Buy • Sell • Lease Buy • Sell • Lease

BASIC FOUR	DEC	DATA GENERAL	HONEYWELL	IBM	IBM
BASIC 4 MODEL 730 w/96KB, 150 MB, (8) VDT's, 300 LPM, 41K Packs \$72,000 Available Immediately ALETA ENTERPRISES INC. (714)552-3559	DEC BARGAINS 11/44 Cache KK11B \$2475 11/44 KE44-A 'CIS' \$2975 11/34A Cache KK11A \$1795 11/70 1/2MB, MK11-CE \$3475 11/44 256KB, MS11MB \$1985 11/34 256KB, MS11LD \$1375 11/34 128KB, MS11LB \$990 11/34 32KB, MS11JP \$175 11/23 MSV11DD mem \$385 11/03 MSV11B mem \$85 DDP8A 32KW mem \$875 DZ11 MUX Bnd. \$1275 FP11A Flng. pt. \$1875 FP11F Flng. pt. \$1865 VT62AC terminal \$485 CALL RAY (617)275-6800	Data General Equipment For Sale 8520-F MP/100 w. 32KB RAM and 32K EPROM sockets 8681 Add-on 32KB RAM with 32K EPROM sockets 4225-S Communications Controller 4226-S 1-Line Synchronous Controller 4227-S 4-Line Asynchronous Controller Price negotiable, quantity discount available, immediate delivery. Reply to CW-A3324 Computerworld Box 880 Framingham, MA 01701	HONEYWELL 62 USERS WE BUY-SELL-LEASE & TRADE Your Honeywell 62 Equipment Available Immediately MSU 330 disk drives, MTU 220 tape drives, and VIP 7700R's The Computer Place 4555 Van Epps Rd. Brooklyn Heights, OH 44131 Call Bill Briggs 216-351-7444 TWX 810-421-8446	IBM 5120/5110 SYS 32 SYS 34 Tubes & Printers Available Immediately We Also Buy IBM Equipment National Data Systems, Inc. 50 Congress St., Boston, MA 02109 (617)720-1313	For Sale 3741 DATA RECORDER Currently on IBM Maintenance \$4000 Contact: (608) 746-2571 Bill Vaughn
BURROUGHS WANTED TO SELL 1855 SYSTEM • With 524KB, Multiline control • (2) 206 Drives, 750 LPM Printer WANTED TO BUY • TD380 CRT's, MT983 CRT's • All Systems & Peripherals B1955 Avail. 4th Quarter Mr. Ross (216) 292-3774 BUY & SELL 880 through 87800s 206/207/226 Disk Drives B9246/47/49 Printers Mag Tape Subsystems TD & MT CRT's TU/DC/CP/TT Terminals All Peripherals & Terminals Call Mr. Pettus or Mr. Buenger (312) 279-1160 For Sale - Best Offer BURROUGHS (33) TU1755 (23) DC125 (10) TU1766 (5) DC145 (45) TU1856 Continuously maintained CALL: ANDY HILL (415) 982-8100	FOR SALE BY OWNER 358 Complete w/Software 1134A w/2 RK07 Disk Drives, (2) VT100's, (1) LA180, (8) Disk Packs, Cabinets & Work Stations. Retail Software Ind.: Inventory Mgmt., A/R, Gen. Led., Mail List, Word proc. 4 Months Old. Must Sell, Best Offer Contact Al Heller (213)852-9354 MAINTENANCE POP-11/03 THRU 11/70 PERIPHERALS: CDC, PERTEC, PRINTRONIX & OTHERS Servicing: San Jose, Monterey, Santa Rosa, Sacramento, San Francisco, Santa Cruz 408/293-5202 SCIENTIFIC RESEARCH MANAGEMENT CORP. FOR SALE DIGITAL COMPUTER SYSTEM MODEL SV800AA-AA 1 MB Error Correcting Memory VAX 11-750 CPU 124 MB Disk & Controller (2) LA38 Console Terminals 285-1 PM Line Printer Under DEC Maintenance, Never Used. Call (813)321-4772 Ask for Vince Vally	FOR SALE ECLIPSE C350 SYSTEM Includes: 1 Mb, 3 Bay Cabinet, (3) 6061 Disk S/S, (1) 4215 600 LPM, (1) 6027 Nine Track, (1) 4251 Comm., (2) 4257 ALM-16, (4) 4261 EIA, (15) 8053 Terminals. Will Configure As Needed International Computing Systems (812)941-2941 INVENTORY REDUCTION SALE PROCESSORS S120, 512 KB, 16 Slot, NEW w/MBS Software CS-50, 256 KB, Cabinet Nova 4/5, 32 KB, 16 Slot, NEW w/MBS Software Nova 1200 DISK 6061-A 192 MB Disk Add-on 4231-A 92 MB Disk Add-on 6100 25 MB 1.26 MB Diskette s/s 6070 20 MB Disk Subsystem 6031 Single Density Floppy TAPE 6021 800 bpi Magnetic Tape MEMORY Nova 4 256 KB MOS Eclipse 256 KB MOS Nova 3 64 KB MOS Nova 3 32 KB MOS Eclipse 16 KB Core Eclipse 8 KW Core COMMUNICATIONS 4251 Communications Chassis 4258 8 Line ALM-16 4063 Quad Multiplexer Cassette I/O Basic I/O PRINTERS 4210 320 LPM 4034-C 300 LPM CABINETS 1012-K Single Bay MBS, INC., (608)273-2986	Largest Discount Anywhere 24 Hour Delivery DPS 6/32, 6/34, 6/48, 6/54, 6/74, 6/96 (15) 256KB Memory \$6500 (8) MSU9604 256MB Disk Dr \$29,995 (99) MSU9607 Dual 67MB Dr \$32,000 (99) CDR9638K 80MB Disk Dr \$9800 (4) CDR9638 80MB Disk Dr \$12,900 (10) WST7801 CRT's \$2900 (10) WST7207 CRT's \$1800 (40) VIF7203 CRT's \$1387 (10) VIF7300 CRT's \$1800 Call: Knaus Systems, Inc. 9950 West Lawrence Ave., Ste. 101 Schiller Park, IL 60176 (312) 671-4630 200/2000 SERIES BOUTRE COMPUTER SERVICE, INC. BUY, SELL/LEASE, and MAINTAIN. Complete and partial systems & peripherals with up to 50% discount on current HONEYWELL prices. Exclusive HONEYWELL Dealer. In Business Since 1976. Call or write W. E. Brown at: 1900 Southcrest, Arnold, MO 63010 (314)644-3323	IBM 5120/5110 NEW 5291's \$88 - 24 Mo. Lease \$110 - 12 Mo. Lease SAVE ON PURCHASE CALL 800-328-6729 DATASERV Also Available 5292's New 5291's, 5292's Qty. discounts - Lease 3340 A2, \$542/Mo. Sale/Short term lease Vargo Companies 313-254-2850 IBM 5320-B34 IBM Maint.. Avail. Now \$6000 MIDLAND MARKETING CO. (612)933-4146 IBM 8100 INFORMATION SYSTEM 8130 Processor 8101 Disc Storage Unit 8809 Mag Tape Unit 3289 Line Printer Asking Price is Negotiable! Contact: Tom Lewison (417) 831-2801 Bell Savings and Loan Association P.O. Box 1775 S.E. 5 Springfield, MO 65805	5 New IBM Displaywriters with 192K, Diskette Unit-Double Density, Display Module, 25 Line with 96 Character Keyboard. Call For Discount Pricing: Data Systems Consultants, Inc. 219-485-1695 WANT TO BUY SYSTEM 34's ALL MODELS Hans Bressler DATA 3 COMPUTER CORP. (612)941-9495 (800)328-7938 FOR SALE IBM SYSTEM 3/15 96K, 100MB, 600LPM, Console & 3741 Complete: \$9,000.00 384K, 200MB, 600LPM, Console & 3741 Complete: \$24,000.00 Call C. HANNA (416)441-3143 SYSTEM 32/34/38 BUY SELL LEASE Peripherals-Features Disk & Memory Upgrades MIDLAND MARKETING CO. (612)933-4146
NCR NCR BUY/SELL/LEASE 658 DISK UNITS Eligible for NCR Maintenance Available Immediately HARWOOD & ASSOC. 2 Northgate Park, Ste. 304 Chattanooga, TN 37415 Tel.(615)870-5500	DEC NEW & USED 11/34A-YE (NEW) \$10,500 FP11-C (NEW) \$4,950 DL11-W (NEW) \$500 DMC11 (USED) OFFER Systems • Options • Peripherals LAKEWOOD COMPUTER CORP. 3260-9 Keller St., Santa Clara, CA 95050 (408)266-2545 INVENTORY CLEARANCE All New DEC Systems & Components DECmates w/lwp. Software 11/24-AC Box 11/44-CA Box TU78-AB Master Tape Drive TU78-AB Master Tape Drive VAX 11/780, 750, & 730 Custom Software ACCESS INTL. (617) 367-5082	FOR SALE IBM 3370 Disks A1 & B1 Available 9/25 F.O.B. NJ Computer Merchants, Inc. (914) 238-9631 FOR SALE (1) 3370-A1 (ss) (3) 3370-B1 USED, AVAIL. 10/1/82 Call John M. Costello RALION CORP. 49 Riverside Ave., Westport, CT 06880 (203)226-1114 FOR SALE IBM 370/135 512K Loaded w/(1x8) 3330-1, (1x4) 3420-5 COMPLETE (214)691-3020 FOR SALE IBM 3864 & 3865 Modems RIMON T209A Modems (9600 bps) M & M DATA PRODUCTS, INC. 408 Main St., Metuchen, NJ 08840 CONTACT: MIKE SIMON Tel. (201)494-2610	IBM FOR SALE (FREIGHT PREPAID) (1) 2821-3 w/(2) 3615 & UCS \$2,600 (4) 3287-1 w/8331, 8700 \$3,900 (5) 3344-B2 or B2F 38% of list (1) 3350-A2F w/8150 57% of list (1) 3350-B2F 57% of list WANT TO BUY MOST IBM EQUIPMENT OCM, INC. (913)381-2406 For Sale Or Lease (55) 3287-001 with 8331, 8700 (55) 3276-002 with various feat. October Availability Central Computer Merchants, Inc. (312) 537-0970	For Sale or Lease Various IBM Peripherals Tapes, Disks, Tubes, etc. Call For Detailed Listing Corporate Funding (313) 642-3070 4341-M2 LEASE OR SALE NOV. AVAIL. 214 783-1212 FOR SALE 5110-B22 120 CPS Printer Dual Diskette F.O.B. NYC Call Ron Gibb Computer Merchants, Inc. (914) 238-9631 SYS 3/15D Complete System \$7500 3776-2 1 Yr. \$700/2 Yr. \$400 Purchase \$15,900 SYSOMP (813) 799-4310 Collect 3330 Disks Sale Or Lease Available Now (212) 783-1212 For Sale Or Lease Available Now IBM 3038 Multisystem Unit Charter Financial 313-644-4887 MUST BUY NOW IBM S/3-15 D26 3344 B2, 3411-3, (32) 3277-2 w/4631 1403 N1, (4) 3287-2, 3741-1 Vargo Companies 313-254-2850	FOR SALE OR LEASE System 32-34 CRT's & PRINTERS THE COMPUTER TRADERS, INC. P.O. Box 7955, Marietta, GA 30065 CALL: Dave Binkley (404)955-0360 FOR SALE SYSTEM 34-F35 With Communications 5251-11 & 3262-B1 3203-5 WANTED: SYSTEM 34-C23 Call Tom or Jake Volpenheim (513)721-3399 SYSTEMS 34/38 Lease or Sale WANT TO BUY S/34's (FOR INVENTORY) Models & Peripherals WE PAY CASH LEAS PAK INTERNATIONAL Tel.(817)268-0023 WANT TO BUY IBM System 34 Processors Printers, Displays Call Dan Cyr 503/222-2226 Computer Products Unlimited, Inc. 3477 N.W. Yeon Ave. Portland, Oregon 97210 WANT TO BUY SYSTEM 7's 5010-E 64, 5998-T01, 3340-A02 SERIES 1's Mod 4955D, 4978, 4962-2F Call Dan Lundy (206)641-7363
SPERRY UNIVAC For Sale UNIVAC BC/7-700 Good Condition, 64K, 10MB, (2) CRT's, 200CPS Printer, Packaged Software. Call Howard Sheldon at (402) 592-3170 FOR SALE B/C7-800, 20 MB, 128K, (2) CRT's, 200 CPS Printer, Certified for mfg. maint., \$16,000. Stan Nystrom 1-816-474-1553	DEC SPECIALS LA120-AA (Unused) \$1600 LA120-RA (Unused) \$1500 LA120-GA (Unused) \$1600 LP05-VK (New) \$4500 MS11-JP (Unused) \$79 MS11-KE (Unused) \$450 MS11-LB (Unused) \$850 SEVCO INC. (617) 393-3025 FOR SALE VAX 750 TS11 TAPE RGM80 DISK Like New Under Continuous DEC Maint. \$85,000 Call Mr. Thomas (603)627-1127 MISC. SYSTEMS Northern Telecom 445 (5year) 128K Main Memory 144CPS Printer 20MB Fixed Disk 2 CRT's Cartridge Tape Call: Writing Sales Roger W. Foley (414) 482-7800 Wanted to Acquire PRIME COMPUTER i5000, i750, i450 or i1000, with disk and at least 1.5 megs memory. Coated Ink Anderson Gathers Software Inc. (713) 699-5711	FOR SALE BY: LEVITZ FURNITURE, INC. (203)741-2926 "Data General Equipment" Nova 2/10 CPU Chassis \$300 CPU Boards with APL \$200 8kw Memory Boards \$100 19kw Memory Boards \$200 404 SLA Boards \$200 Basic I/O 4007/8/10/23/19 \$150 4063 Quad Mux Boards \$200 "Data General Compatible" Pentronix P300 300pm Pfr. \$3500 Printer Controllers \$100 Dabio 1620 KSR Pfrs. \$1500 Dynex 6203 10MB Disk \$900 Digitone D3001 Disk Cntrs. \$900 "Miscellaneous" ICC LSI 20 Modems 2000bps CALL Nova 3/12 ULM 5 Nova 3 Mem 64KB Nova 3 Core Mem Nova 4s 64kb New \$1,150 DG 6122-A \$23,500 DG 6122 Disk 9/8 \$26,500 DG 4215 300 LPM Pfr. S/S \$8,800 SYSDEN DATA LTD. (514)496-7777	FOR SALE IBM 3864 & 3865 Modems RIMON T209A Modems (9600 bps) M & M DATA PRODUCTS, INC. 408 Main St., Metuchen, NJ 08840 CONTACT: MIKE SIMON Tel. (201)494-2610	FOR SALE IBM 3864 & 3865 Modems RIMON T209A Modems (9600 bps) M & M DATA PRODUCTS, INC. 408 Main St., Metuchen, NJ 08840 CONTACT: MIKE SIMON Tel. (201)494-2610	More Bulletin Board on the next page.
FIND A DISK OR A DEC IN THE CLASSIFIED PAGES OF COMPUTERWORLD	Wanted to Acquire PRIME COMPUTER i5000, i750, i450 or i1000, with disk and at least 1.5 megs memory. Coated Ink Anderson Gathers Software Inc. (713) 699-5711	Your ad can be seen here for just \$99.	FOR SALE IBM 3864 & 3865 Modems RIMON T209A Modems (9600 bps) M & M DATA PRODUCTS, INC. 408 Main St., Metuchen, NJ 08840 CONTACT: MIKE SIMON Tel. (201)494-2610	FOR SALE IBM 3864 & 3865 Modems RIMON T209A Modems (9600 bps) M & M DATA PRODUCTS, INC. 408 Main St., Metuchen, NJ 08840 CONTACT: MIKE SIMON Tel. (201)494-2610	FOR SALE IBM 3864 & 3865 Modems RIMON T209A Modems (9600 bps) M & M DATA PRODUCTS, INC. 408 Main St., Metuchen, NJ 08840 CONTACT: MIKE SIMON Tel. (201)494-2610

The Bulletin Board		The Bulletin Board		The Bulletin Board	
HEWLETT PACKARD	HEWLETT PACKARD	TI	DISK DRIVES	TERMINALS	MISC.
HEWLETT PACKARD 1000 • 2000 • 3000 SERIES Systems • Peripherals AIRBORNE DATA SYSTEMS Purchasing: 209/533-2400 Accounting: 408/262-5137 TELEX 178256 FAX AVAILABLE	FOR LEASE (ALL OR PART) HP 3000 III, 2 meg CPU 7970-E Tape Drive (4) 7925 Disk Drives (2) 600 LPM Printers (7) 2645 Term. (1) 2626 Term. THE COMPUTER PLACE 4595 Van Epps Rd. Brooklyn Heights, OH 44131 Call Mike Mason 216-351-7444 TWX 810-421-8446	FOR SALE TI 820 KSR Quantity Available Immediately \$925 each Cass Marketing Services, Inc. (213)956-4982	CDC 9766 \$11,500 Call Ann (714) 632-6925	DATASOUTH DOT MATRIX PRINTER 180 cps OEM PRICING!!! IMMEDIATE DELIVERY MCD CORPORATION (313)924-1020	MEMOREX 1270's & TERMINALS Call (617) 526-4301 COASTAL COMPUTERS
BUY & SELL 1000 & 3000 Systems • Components WESTERN DATA SALES, INC. (213)539-8917	FOR SALE HEWLETT PACKARD LASER PRINTING SYSTEM (2) 2680 Laser Printers 3000-40 (1024 KB mem) 7970 Tape Drive 404 Plus 64 MB Disk Drives 2648 Plus 2621 Terminals Contact Kevin Doherty (617)491-8800	WANG		For Sale BEEHIVE MICRO 4400 TERMINAL Used very little Compatible to Burrough's \$1500 Contact: (503) 746-2571 Bill Vaughn	NAS 16K Chip Memory Available Now (214) 783-1212
HEWLETT PACKARD SERIES 1000 • 3000 AND ALL HP PERIPHERALS encore 213-393-4932	MUST SELL UNITED PERIPHERALS 480 Mb disk drive for Hewlett Packard 3000 Series 30/33, 40/44 and 64 Systems. Available Immediately BY OWNER: (415)468-2635	Wang Minis & Micros • Contract Programming* • Ansi Cobol • Accounting & Business Applications • Consulting Hardware & Software • Complete Training & Support Call (201) 469-2229 CLIFF DATA SYSTEMS, INC.	MODEMS	Call 1-800-343-6474 to place your ad	COMPUTER GRAPHICS DIRECTORY Profiles 300 suppliers of CG hardware, software, systems & services. Includes application and product cross indexes, 128 pages. Money back guarantee. Lisa Smith, (617) 443-4671
HARDWARE SPECIALS HP3000 Systems & Peripherals Datacom Equipment Call Hans Frontschek (212)964-9600 Software Systems Technology Inc. 15 Park Row, New York, NY 10038	WANTED ALL HP EQUIPMENT Especially SERIES 44 & Related Peripherals Available Immediately FOR SALE OR LEASE 3705A Terminals FUNDWAYS, LTD. (212)494-7407	VS Memory MVP Memory DPU With Phoenix Drive 2236 MXD Board Triple Controller Call John Kelley (603) 882-3780	CODEX LSI 48FP/96FP MODEMS... 50% off list CODEX 2400 BPS Modems... \$250 RIXON 208A/B 4800 Modems... \$900 INFOTRON Ch. Stat. Mux... 40% off list MICOM 10% Off List On All New Mux's In Stock. WARWICK DATA SYSTEMS Call Jay Werres (201)452-9057	MISC.	Rebuilt Kodak Microfilm and Fiche Equipment in Boston Area Reliant 700 & 750 Microfilm T-Endorse, Sequential Imprinter Work Station Minolta and Kodak service contracts available Metropolitan Microfilm of New England (603) 887-3535
Overstocked-HP Terminals Reasonable Offer Buys 2626A 2621P 2623A HP85 HP87 Mr. van der Kaay 800-237-9853 813-934-0829	EQUIP YOURSELF IN THE CLASSIFIED PAGES OF COMPUTERWORLD	Wang Equip's 2280N-3 PHNX \$8,200 2265V-1 SMD (75M) \$6,700 2273-1 Printer \$3,900 5574 W.P. Printer \$5,900 CFN Associates, Inc. (617) 372-8536 We BUY & SELL Wang	PRINTERS	COMPUTER FLOORS Used-New Bought-Sold Installation Alteration Refinishing Parts and Service RC PLUS ASSOCIATES, INC. 16 Voorhis Lane Hackensack, NJ 07601 (201)488-3333 or (212)564-4636	WANTED Vintage Computers Computer Boards Components - Wire Contact Mike (201)779-3838 M & S SCRAP 438 Paulison Ave., Passaic, NJ 07055 Trade your scrap for gold and silver
WE BUY AND SELL HP 3000 COMPUTERS SERIES III, 30 & 33 Complete Systems, Memory, Terminals, Disk Drives, Tape Drives, Miscellaneous Parts AVAILABLE IMMEDIATELY FINLEY & ASSOCIATES (213) 628-8846		FOR SALE (20)5MB MEMOREX Disk Packs Model #94-52224-06 WANG 2330-1, 2, 3, Wang 2260B, WCS30, 2260V or Western Dynex 565 removable. Brand New Sacrifice \$50 Each (800)251-1078 Ask for Al Edwards	PRINTERS - PRINTERS - PRINTERS FOR SALE OVER 200 CENTRONICS MODEL 588 All Under TI Maintenance Contract CONTACT JERRY WRIGHT 412-323-4251	For Sale Microdata Reality 6000 128K Core Memory 100 MB Disk (2-50's) 16 Ports 16 Terminals Tape Drive & Printer 2 Teletype 40 Printers Call (208) 356-3666 (Floyd)	Your ad can be seen here for just \$99.

SOFTWARE FOR SALE

**GB
ACS**

**For Your
IBM System/38**

A Major Applications Software Package

If you have or are planning to install IBM's System/38 you should take advantage of the GBACS® (General Business Applications Control Systems for IBM System/38) software package. The modules making up GBACS® have been developed by RTC Systems Inc., a group of consultants which has been involved with the IBM System/38 since its inception. The outstanding knowledge and many years of experience of the RTC Systems' specialists have been applied to creating programs for ORDER PROCESSING/INVOICING, ACCOUNTS RECEIVABLE, ACCOUNTS PAYABLE, GENERAL LEDGER, MANUFACTURING SYSTEM, PAYROLL, AND PURCHASING SYSTEM. (MRP SYSTEM being developed for delivery in November.) The modules, which are independent and completely integrated, run entirely in RPG III in a data base environment. And you will have the advantage of the RTC Systems' staff with their own IBM System/38 at the RTC Research Center for support when you are installing the programs. Call RTC Systems Inc. today for complete details of the GBACS® software package.

RTC SYSTEMS INC.

55 Plain Street
North Attleboro, MA 02760 (617) 695-5008

Elegant Software

For IBM S/34 & S/38 Computers

General Ledger/Financial Reports
Accounts Payable
Accounts Receivable
Payroll/Personnel
Order Processing
Inventory Management
Mailing Lists
Fixed Assets
Oil & Gas
Job Cost

J. D. Edwards & Company
Two Denver Technological Center
Englewood, CO 80111
303/773-3732
Dallas/214/484-8911
Newport Beach/714/751-5302

UNIX
Unix is a trademark of Bell Labs.

**Unix Operating Systems
on DEC equipment.**

IDS

international data services, inc.
(408) 730-UNIX

Have you spent too much
time and money trying to
get your application work-
ing on the

**IBM
Series/1**

You should try PXS, an ap-
plication generator for the
Series/1 - over 1000 cur-
rent users.

H & A Computer Systems
P.O. Box 15025
San Francisco, CA 94115
415-434-3517

**SECURITY
for
IBM 5280**

Complete security for your sys-
tems by controlling access down
to the program level.
Peace of mind for \$500.
For complete user manual call or
write

Turner - Moore Associates
P.O. Box 123
St. Matthews
South Carolina 29135
Phone (803) 655-5475

ZX81 APPLE PC MICRO USERS

GGI Has Great Games.
On Cassettes Or Diskettes
(Please Specify Type)

- STAR TREKKER - Based on the TV series \$30
- CAVE-IN - An Adventure Game (Vol. I) Possible \$1000 Prize \$35
- Send Check or Money Order (Made Out To Great Games Ink)
- GGI
- P.O. Box 648
- Boca Raton, FL 33431
- (30-60 Day Delivery)

IBM 5110/5120 SYS 23 DATAMASTER

General Ledger \$600
Accounts Payable \$600
Accounts Receivable \$600
Payroll \$600

Owatonna Computer Services
P.O. Box 216
Owatonna, MN 55060
(507)455-0741



TIME & SERVICES

MEMORY & COMPUTER REPAIRS

ANY MANUFACTURER'S
MEMORIES
CORE — SEMI
DEC® — DATA GENERAL
COMPLETE CPU'S AND
MEMORIES

T D C

THREE DELTA CORP
1038 Kiel Court, Sunnyvale, CA 94086
(408) 734-2680
TWX-910 339-9511

TIMESHARING AVAILABLE

VAX 11/780-VMS
PDP 11/70-RSTS/E

- FORTRAN, COBOL, BASIC
- DATATRIEVE
- ORACLE®
- STATISTICAL PACKAGES
- DECNET
- TYMNET ACCESS

CONTACT:

James F. Kelley
INSLAW, Inc.
Washington, D.C.
(202) 828-8600

© trademark of Relational Software, Inc.

TIMESHARING on VM/CMS

APL FORTRAN

Synsort
Geographic Databases
Graphic Software
Wall-Size Plots

CALL OR WRITE: Princeton Computer Graphics
609-683-0234 220 Alexander Road
Princeton, N.J. 08540
Howard Rosen Bill Candee

SELLING?

Sell your product or
service in
Computerworld
classifieds.

Join the thousands of
advertisers who use our
classifieds because they
get results.

You can find buyers for
discs and DEC's,
terminals and
timesharing,
software and
System 370's.

More than half a million
active computer people
read Computerworld
each week, and you can
reach them efficiently in
Computerworld
classifieds.

To place your ad,
or to get a rate card with
complete details on
Computerworld
Classifieds,
call or write:

Classified Advertising
Computerworld
P.O. Box 880
Framingham, MA 01701

ADVERTISERS' INDEX

Academic Software	88
Advanced Electronics Design	59
American Tel. & Tel./Long Lines	ID/20
American Transport	87
Applied Data Research	3,13
Artificial Intelligence Corp.	9
Babb Computer Associates, Inc.	ID/24
Glenn A. Barber & Associates	24
Bausch & Lomb	55
BDS Computer Corp.	17
John Beall	99
Boole & Babbage	ID/12
Braegen Corp.	78
C.C.S., Inc.	100
Chubb Advanced Training Center	36
Cincom Systems, Inc.	71
CMI Corp.	ID/5,10
Codex Corp.	14-15,84
Communications Research	ID/15
CompEd	ID/13,31
Computer Devices, Inc.	52
Computer Technology Group	ID/14
Computerworld International	108
Computerworld Office Automation	94
Computerworld Spain	76
Compuware	69
Control Data Corp./LPSD	32-33
Cullinane Database Systems	ID/8-ID/9
Database Design, Inc.	25
Data General	90-91
Datagraphix	62-63
Datapro Research Corporation	27
Data Rentals/Sales, Inc.	85
Data Set Cable Co., Inc.	100
Datasource Systems	46
Dalaware, Inc.	36
D.B. Systems, Inc.	ID/19
Decision Data Computer Corp.	93
Digital Associates	ID/13
Digital Equipment Corp./NPM VAX	56-57
Digital Equipment Corp./Terminals	40-41
Digital Research	47
The DMW Group	18
D.F. Facilities	54
DTSS/Tempo	53
Dynan Corp.	72-73
Eastman Kodak	39
Emulex Corporation	30
Essential Computer Products	100
The Functionality Group	53
Fusion Products	72
Gemini Information Systems	102
General Research Corporation	38
Genesys	48-49
Goal Systems, Inc.	ID/19
Hazeltine	23
Hanco Software	28
Hewlett Packard/BCC	66-67
Hughes Aircraft	ID/21
H & W Computer Systems, Inc.	ID/17,74
IBM/Modem	88
IBM/SSD	80-81
ICCP	54
ID Systems	22
Infodata Systems, Inc.	45
Informatics-Educational Div.	8
Informatics Software	34-35
Infowild	ID/23,28
Innovation Data Processing	7
ITT Worldcom	ID/1
Kalbro	12
K/W Control Systems	ID/6
Lenier Business Products	42-43
Lawson Associates	ID/23
Lee Data	ID/12
Lifetime Learning Publications	ID/17
MAB Jewelers	ID/21
MacKinney Systems	54
M/A-COM OSI	19
Management & Computer Services	ID/22
M. Bryce & Associates	10, ID/16
MCBA	16
Memorex	86
Memorex-Communication Group	ID/10
Memorex-Tape Division	106
Microdata	ID/4
Micro-Term	24
MTI Systems	78
Multiplications	144
NEC Information Systems	74
Newcorp Products	106
O'Neill Data Systems	107
On-Line Software International	38
Otrona Corporation	72
Pansophic Systems, Inc.	79
Polygon Associates	70
Prestige Expositions	83
Quadrant Corp.	64-65
Questronics	ID/16
Softmatics Corp.	6
3R Computers	92
Selamar Corp.	87
Sheraton Tara	44
Signal Technology	102
Sinclair Research Ltd.	101
Software Corp. of America	29
Southwest Software	ID/17
SPSS	50
Stratus Computer, Inc.	103
Synapse	98
Syntax	44
SysEd	12
Systems Dimensions	31
Systems Documentation Inc.	ID/22
Technology Transfer Institute	ID/24
Teletype Corp.	104-105
Televideo Systems	20-21,95
Teltek	25
Texprint	ID/20
Tone Software	102
Transnet Corporation	100
Triangle Software	ID/18,102
Tymshare-Field Maintenance	ID/11
University Computing Co.	82
U.S. Data/Marketing Services	ID/16
The User Group	55
Verbatim	58
Vertex Systems, Inc.	65
VM Software	70,76
Walker Interactive Products	26
Wang Laboratories, Inc.	51
Xerox-Computer Service Division	68
Yourdon	5
Zenith Data Systems	ID/7
Zilog-Systems Division	96-97

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Computer Services

4341-2 370/158-3

VS1-CICS-ROSCOE-DOS
REMOTE JOB ENTRY
CICS DEVELOPMENT
CICS PRODUCTION
CUSTOMIZED SOFTWARE

CONTACT JOE BARRETT
(201) 777-3454
15 MINUTES FROM LINCOLN TUNNEL
ONE PASSAIC STREET
WOOD RIDGE, N.J. 07075

LOOKING FOR DEVELOPMENT TIME?

NO KILOCODE TICK CHARGES
NO CPU CHARGES

BASIC PLUS
COBOL
PASCAL
C
WORD-H WORD PROCESSING
WAVE
TECO
EDIT

by **Omni computer.**
1430 Broadway, New York, N.Y. 10018

TIMESHARING AVAILABLE

VAX 11/780-VMS
• 8 MB; Floating Point Accelerator
• FORTRAN, COBOL, BASIC
• DATATRIEVE, FMS, IMSL
• Telenet Access
• Blocks Of Time Available
• Negotiable Rates

Contact:
Richard Bator
ERCO, Inc.
Cambridge, MA
(617) 661-3111

VSAPL

- Development Time
- 4800 Baud Full Screen
- Reasonable Fixed Cost Rates

Interprocess Systems, Inc.
East Coast Only
Andy Dickey
(914) 271-6211

We Do It All...
in Depot
Maintenance

COMPUTER SUPPORT SERVICES

31265 W. ASHOURA RD., WESTLAKE VILLAGE, CA 91361

TYMSHARE®

INDO CALIFORNIA (213) 889-0031 OUTDO CALIFORNIA (800) 423-6321

* CDC is a registered trademark of Control Data Corporation
* DEC is a registered trademark of Digital Equipment Corporation

DEPOT COMPUTER REPAIRS

MEMORIES
POWER SUPPLIES
DISKS PACKS AND TERMINALS
ANY MANUFACTURER

DEC-DG
ALL BOARDS
1-2 WEEK TURNAROUND

DIGITAL DATA SYSTEMS, INC.
1551 N.W. 15 Ave., Plantation, FL 33313
305-792-3290
1-800-327-8662
TELEX-232005 AFT DIG

COMPUTER TIME FOR SALE

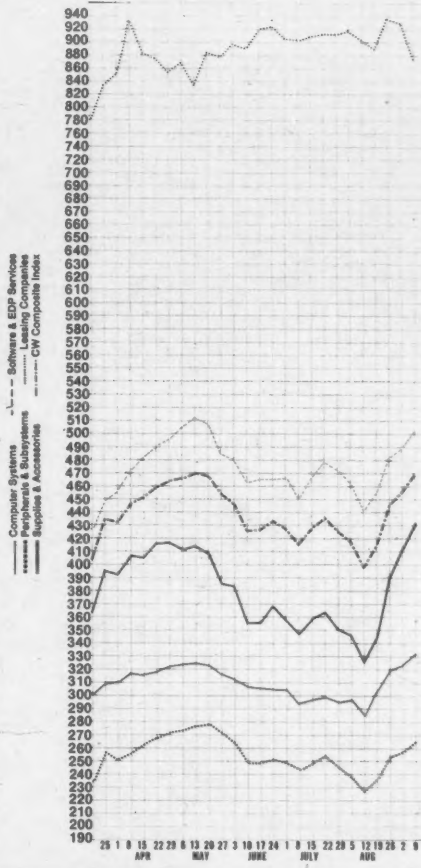
I.B.M. 360-40

All Shifts, 128K, 4-2401
MOD-2, 9-2314, 1403-N1,
2540,

From \$35/Hour

Restaurant Associates, Inc.
1540 Broadway
New York, N.Y. 10036
Contact:
Al Palmo (212) 997-1411

Computerworld Stock Trading Index



Computerworld Sales Offices

Roy Einrenhofer, Vice-President/Marketing, Donald E. Fagan, Vice-President Sales, Frank Collins, Manager, Display Advertising, William J. Mills, Manager, Classified Advertising, Diana La Muraglia, Manager, International Marketing Services, COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701. Phone: (617) 879-0700 Telex 95-1153.

BOSTON SALES OFFICE: Chris Lee, Northern Regional Manager, Edward P. Marecki, Joseph Fitzhugh, District Managers, Kathy Doyle, Diane Sukey, Account Coordinators, COMPUTERWORLD, 375 Cochituate Road, Box 880, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

NEW YORK SALES OFFICE: Michael J. Masters, Eastern Regional Manager, Peter Senft, Doug Cheney, Ray Corbin, District Managers, Fred LoSapio, Sales Assistant, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, N.J. 07652. Phone: (201) 967-1350.

CHICAGO SALES OFFICE: Art Kossack, Newt Barrett, District Managers, Jan Raska, Account Coordinator, COMPUTERWORLD, 2600 South River Road, Suite 304, Des Plaines, Ill. 60018. Phone: (312) 827-4433.

LOS ANGELES SALES OFFICE: Jim Richardson, District Manager, Bob Hubbard, Delbra Pendergrass, Account Managers, Beverly Raus, Account Coordinator, Eileen Dunn, Recruitment Account Manager, Phone: (415) 421-7330. COMPUTERWORLD, 18008 Skypark Circle, Suite 200, Irvine, Calif. 92714. Phone: (714) 556-6480.

SAN FRANCISCO SALES OFFICE: William J. Healey, Western Regional Director, Barry G. Milone, Rick Jamson, Account Managers, Ruth Gordon, Account Coordinator, Eileen Dunn, Recruitment Account Manager, COMPUTERWORLD, 300 Broadway, Suite 20, San Francisco, Calif. 94133. Phone: (415) 421-7330.

JAPAN: Mr. Shohji Kurita, COMPUTERWORLD JAPAN, 1-19-7 Shintomi, Chuo-ku, Tokyo 104. Phone: (03) 551-3882. Telex: 252-4217. Esteban H. Yamada, Tokyo Representative Corp., Yamaguchi Bldg., 2-12 Kanda Jimbo-cho, Chiyoda-ku, Tokyo 101. Phone: (03) 230-41178. Telex: J26860. **UNITED KINGDOM:** Richard Hease, ECC Publications, 30-31 Islington Green, London N1. Phone: (01) 359-7481. Euan C. Rose, Robert Hall, BEERE, HOBSON ASSOCIATES, 34 Warwick Rd., Kenilworth, Warwickshire, CV8 1HE. Phone: (0926) 512424. Telex: UK-311951. **WEST GERMANY:** Eckhard Updekel, CW PUBLIKATIONEN, Fredrichstrasse 31, 8000 Munich 40. Phone: (089) 34-90-61. Telex: W. Ger-5-215350-HKFD. **AUSTRALIA:** Alan Power, COMPUTERWORLD PTY. LTD., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 439-5133. Telex: SECCO A25468. **BRAZIL:** Eric Hippau, COMPUTERWORLD DO BRASIL, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25 10th Floor, 20031 Rio de Janeiro, RJ. Phone: (021) 240-8225. Telex: 11-32017 (WORLD BR). **MEXICO:** Richard Small, COMPUTERWORLD de MEXICO, Oaxaca 21-2, Colonia Roma, Mexico City D.F. Phone: (505) 514-4218. (505) 514-6309. **FRANCE:** Patrick Morel, Le Monde Informatique, 42, Avenue Montaigne, 75008 Paris. **SPAIN:** Neil Kelley, COMPUTERWORLD Espana, Barquillo, 38, Madrid-4. **DENMARK:** Helle Lind Christensen, Computerworld Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone: 01-1234-11.

CW COMMUNICATIONS/INC.

Board Chairman/Publisher

Patrick J. McGovern

President

W. Walter Boyd

Senior Vice-President

Lee Vidmer

Group VP-Communication Services, Jack Edmonston Group VP-Circulation, Margaret Phelan, VP-Marketing, Roy Einrenhofer, VP-Sales, Donald E. Fagan, VP-Finance, William P. Murphy, VP-Editorial, John Whitmarsh, VP-Special Publications, Robert Ziegler.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 880, Framingham, MA 01701. Phone: (617) 879-0700, Telex: 95-1153.

SALES Vice-President, Donald E. Fagan, Display Advertising Manager, Frank Collins, Display Advertising, Tracey Eastman, Anne Hadley, Pam Valentinas, Julie Sullivan, Classified Advertising Manager, William J. Mills.

COMMUNICATION SERVICES Group Vice-President, Jack Edmonston, Director Research, Kathryn Dannen, Sales Promotion Manager, Noreen Kimball.

CIRCULATION Group Vice-President, Margaret Phelan, Circulation Manager, Barbara Jeannetti, Service Rep, Peggy Kelly, Assistant, Carmela Prante.

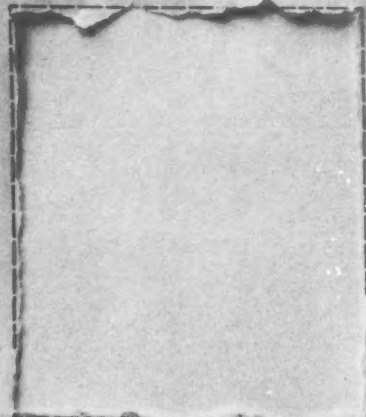
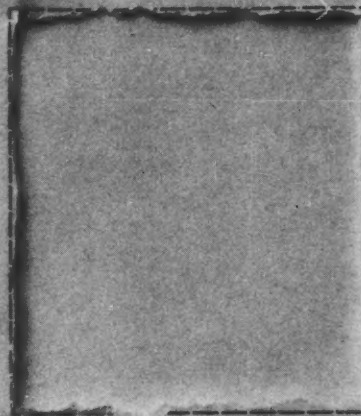
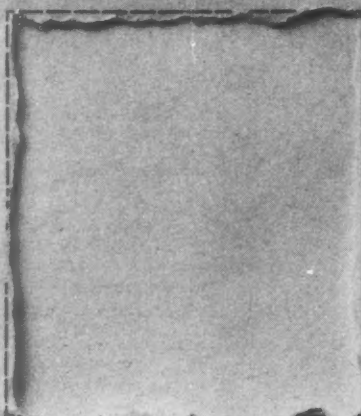
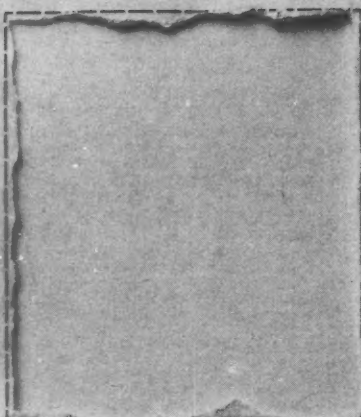
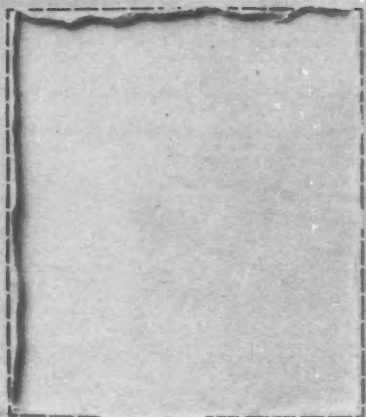
PRODUCTION Production Director, Peter Holm, Production Coordinator, Marlene Stibal, Supervisor, Henry Fling, Systems Manager, Tom Plau, Typesetting Manager, Carol Polack, Art Director, Tom Monahan.

All statistics computed and formatted by TRADE QUOTES, INC. Cambridge, Mass. 02139

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 8, 1982

E X C H	PRICE					E X C H	PRICE					A C C E T E C C O R P O C O G N I T R O N I C S C O M P U T E R C O M M U N.	PRICE				
	1981-82 RANGE (1)	CLOSE SEPT 8 1982	WEEK CHANGE	WEEK PCT CHANGE	1981-82 RANGE (1)		CLOSE SEPT 8 1982	WEEK CHANGE	WEEK PCT CHANGE	1981-82 RANGE (1)	CLOSE SEPT 8 1982		WEEK CHANGE	WEEK PCT CHANGE			
COMPUTER SYSTEMS																	
A ANDAHIL CORP	18-46	23 7/8	-3/8	-1.5	D ADVANCED CORP TECH	1-6	1 3/4	0	0.0	E X C H	1981-82 RANGE (1) <td>CLOSE SEPT 8 1982</td> <td>WEEK CHANGE</td> <td>WEEK PCT CHANGE</td>	CLOSE SEPT 8 1982	WEEK CHANGE	WEEK PCT CHANGE			
N BURROUGHS CORP	28-72	37 1/8	+1 1/8	+3.1	D ADVANCED SYSTEMS INC	9-15	11 1/4	+1	+9.7	N	11	13 1/4	+1	+26.6			
O COMPUTER AUTOMATION	8-28	11 5/8	+1 3/8	+13.4	D AGS COMPUTERS INC	7-10	8 1/2	0	0.0	N	18-28	23 3/4	+5/8	+2.7			
N CONTROL DATA CORP	13-42	30 1/4	+1 7/8	+6.5	D ANACORP INC	10-19	11	+1/8	+6.3	N	4-10	8 7/8	+1 1/8	+12.8			
N CRAY RESEARCH INC	20-48	27 1/2	-5/8	-2.2	D ANALYSTS INTL CORP	2-14	7 1/2	0	0.0	N	1-2	5/8	0	0.0			
N DATA GENERAL CORP	21-87	28 3/8	0	0.0	A APPLIED DATA RES.	13-26	26	+1	+4.0	N	20-40	28 1/8	+1/8	+0.4			
N DATAPoint CORP	11-68	17 1/8	+5/8	+3.7	D ASK COMPUTER SYSTEMS	11-17	16 3/4	+1/2	+3.0	N	17-28	26 1/4	+3/8	+1.4			
N DIGITAL EQUIPMENT	62-113	86 1/4	+1 1/2	+5.3	E ASTRADYNE CORP INC	1-5	1 1/4	0	0.0	A	12-19	13 3/4	0	0.0			
A EECO INC	6-18	8 7/8	+1	+12.6	N AUTOMATIC DATA PROC	21-32	27 1/8	+3 3/8	+14.2	N	18-27	26 1/8	+1/8	+0.4			
N ELECTRONIC ASSOC.	5-13	8 3/8	+7/8	+10.2	D CGA COMPUTER ASSOC	4-25	3 3/4	0	0.0	N	4-15	5 5/8	+1/8	+2.2			
N FLOATING POINT SYST	13-30	25 3/4	+1 5/8	+6.7	D COMPUTER ASSOC INT'L	12-21	21	+1/4	+1.2	O	2-3	2	0	0.0			
N FORBES	22-62	28 1/2	+1/8	+0.4	D COMPUTER HORIZONS	1-3	2 1/4	+1/8	+5.2	N	2-3	2 3/4	+1/8	+3.8			
D FULCRUM CORP GRP	1-3	1/4	0	0.0	O COMPUTER NETWORK	4-9	6 1/2	+3/8	+6.1	N	3-6	5 5/8	+1/8	+2.2			
O GENERAL AUTOMATION	3-18	4	0	0.0	N COMPUTER SCIENCES	11-30	14 7/8	+1 3/8	+10.1	N	1-4	1	+1/8	+11.1			
N HARRIS CORP	21-60	31 1/8	+3 1/8	+11.1	D COMPUTER TASK GROUP	10-23	9 1/2	0	0.0	N	18-40	27 1/2	0	0.0			
N HEWLETT-PACKARD CO	33-54	52 3/4	+3/8	+0.7	D COMPUTER USAGE	2-10	2 5/8	-1/8	-4.5	N	7-18	8 3/4	+1/4	+2.9			
N HONEYWELL INC	80-113	84 1/2	+8 7/8	+11.7	D COMPUTE SYSTEMS	12-21	19 1/4	+1/4	+1.3	N	0-4	1/4	0	0.0			
N IBM	48-73	72 1/2	+2 3/4	+3.9	D CONSERV CORP	8-18	15	+1/2	+3.4	N	3-18	1 1/8	-1/4	-7.1			
D IPL SYSTEMS INC	5-13	5 3/4	+1/2	+9.5	D COMSHARE	6-21	6	+1/4	+4.3	N	18-35	28 1/2	+1 1/2	+5.5			
O MAGNUSON CORP SYST	2-32	2	-5/8	-23.8	N CULLINANE DATABASE	15-37	35 1/4	+1 5/8	+4.8	O	6-17	14 1/2	+1/2	+3.5			
COMPUTER SOFTWARE & EDP SERVICES																	
N MANAGEMENT ASSIST	7-28	10 5/8	+1	+10.3	D CYCARE SYSTEMS INC	8-14	10	+1/2	+5.2	D	21-51	37	+1 1/2	+4.2			
D MINI-COMPUTER SYST	0-4	3/8	0	0.0	D DATA DIMENSIONS INC	1-3	1/4	0	0.0	D	5-15	5 3/4	+1/2	+9.5			
N MODULAR COMPUTER SYS	7-32	8 5/8	+1/2	+6.1	D DATATAB	1-4	5/8	0	0.0	D	7-18	10 1/8	-1/4	-2.4			
N MODHAM DATA SCI	10-32	15	+1	+7.1	D DATATRON CORP	2-11	3 1/8	+1/8	+4.1	N	11-27	14 1/8	+1/8	+1.2			
N MCR	38-76	63 1/4	+4 5/8	+7.6	N ELECTRONIC DATA SYST	15-33	31 3/4	+1/2	+1.5	N	14-28	25 7/8	+1 7/8	+7.0			
N PERKIN-ELMER	17-38	24 1/4	+1 3/4	+7.7	D INFORMATIONICS INC	10-23	13	+1/2	+4.0	D	3-8	9	0	0.0			
N PRIME COMPUTER INC	18-48	27 1/8	+3 3/4	+18.0	D INSYTE CORP	1-2	1	0	0.0	N	38-76	76	+2 1/4	+2.8			
N SPERRY CORP	21-65	26 3/4	+1 7/8	+7.5	D IPSI COMPUTER MARKET	1-2	1 1/8	0	0.0	N	7-17	8 1/4	-1/4	-2.8			
D TANDEN COMPUTERS INC	13-35	24	+1 1/8	+5.4	D KEANE ASSOCIATES	8-4	4	0	0.0	O	8-23	15 3/4	+1/2	+3.2			
N TEXAS INSTRUMENTS	71-151	98 1/8	+8 5/8	+7.1	A LOGICON	12-38	18 5/8	+1 1/4	+6.1	N	18-35	21	+3/8	+2.1			
A WANG LABS "B"	24-37	36 1/4	+3 1/4	+8.9	D MGT SCI AMER INC	17-26	24 1/2	+3/4	+3.1	N	1-21	1 1/4	0	0.0			
A WANG LABS "C"	21-38	37 7/8	+2 7/8	+8.2	D MATHEMATICA INC	8-17	14 3/4	+1 1/4	+9.2	N	10-26	22 3/8	+1 3/8	+7.8			
LEASING COMPANIES																	
D BOOTH FINANCIAL CP	18-28	22 1/2	0	0.0	D MATHEMATICAL APP GRP	12-28	12 1/2	0	0.0	N	7-34	8	+1/2	+6.8			
D CONDICO INC	15-27	18 3/4	+2 1/8	+12.0	D NATIONAL DATA CORP	13-28	18	+3/4	+4.3	N	7-28	7 3/8	0	0.0			
B COMMERCE GROUP CORP	1-1	1/2	-1/8	-20.0	D PANSOPHIC SYSTEMS	8-15	12 1/2	+1 1/4	+11.1	A	4-11	9	+3/8	+7.4			
O COMPUTER INVESTS GRP	1-2	1/8	-1/8	-50.0	N PLANNING RESEARCH	5-13	7 3/4	+5/8	+6.7	N	38-76	41 3/4	+1	+2.4			
D CONTINENTAL INFO SYS	4-9	8 1/2	0	0.0	D PROGRAMMING & SYS	1-2	1 3/8	0	0.0	N	11-17	11 3/4	+1/4	+3.4			
N DFF INC	5-13	10 3/4	+3/4	+7.5	D REYNOLDS & REYNOLD	18-25	22 1/2	+1/2	+2.2	O	3-17	3 5/8	-1/2	-12.1			
D ITEL	1-5	5/8	0	0.0	D SET CORP	17-28	24 1/2	+3/4	+3.1	N	7-18	11 3/4	+1 1/8	+10.5			
O LEASAPAC CORP	1-2	1/8	0	0.0	D SHARED MEDICAL SYST	26-37	35 1/8	+1 3/4	+5.2	N	9-15	12 1/4	0	0.0			
N U.S. LEASING	18-30	27 3/8	-3/8	-1.3	D SCIENTIFIC COMPUTERS	6-18	9	-1/2	-5.2	O	1-3	1	0	0.0			
PERIPHERALS & SUBSYSTEMS																	
N AM INTERNATIONAL	1-15	7/8	-	-11.7	D SOFTWARE AG	5-23	6 3/4	-1/4	-3.5	SUPPLIES & ACCESSORIES							
A ANDERSON JACOBSON	8-28	10 3/4	+1/8	+1.1	N TYNSHARE INC	13-58	18 3/4	+3/4	+3.9								
D AUTO-TRAIL TECHNOLOGY	8-22	12 3/4	-1/8	-0.8	A URS CORP	19-18	11 1/4	+1/4	+2.2								
D BANCTEC INC	7-35	11 1/2	+1 1/4	+12.1	N NYLY CORP	7-20	10 1/8	0	0.0								
A BEEHIVE INT'L	4-18	5 1/2	-1/2	-8.3													
D BOLT-BERANER & MEN	25-18	5 5/8	+3/8	+6.3													
D COMBEX CORP	2-9	2 1/4	+1/8	+5.8													
N CENTRONICS DATA CORP	7-40	8 3/4	+1 5/8	+22.8													



Now Jr. programmers can develop CICS COBOL applications quickly and easily. With no CICS knowledge. Find out how. Get a free demonstration of ACCOLADE—A new concept in CICS program development. Fill out and mail to: David Alschuler, Vice President, Multiplications, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138.

Name _____
Title _____
Company _____
Address _____
Phone _____
City _____
State _____ Zip _____

MULTIPLICATIONS *

Now Jr. programmers can develop CICS COBOL applications quickly and easily. With no CICS knowledge. Find out how. Get a free demonstration of ACCOLADE—A new concept in CICS program development. Fill out and mail to: David Alschuler, Vice President, Multiplications, Inc., 1050 Massachusetts Avenue, Cambridge, MA 02138.

Name _____
Title _____
Company _____
Address _____
Phone _____
City _____
State _____ Zip _____

MULTIPLICATIONS *

Better hurry up or you'll be the last to know about our
CICS development tool.

